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VOLUME 13, NUMBER 5

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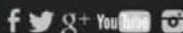
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BUILD LEAN MUSCLE AND BURN FAT

Building the ultimate physique is not easy. But for those dedicated individuals who are willing to put in hard work, it is possible to achieve greatness, get ripped and lean, and reach the goals you set for yourself in the gym— whether you're a beginner or a gym veteran who is trying to take his physique to the next level. For proof of this, take a look inside this month's issue of FitnessRx, where some of the top Men's Physique competitors share what it took to get to the top and how they plan to stay there.

Believe it or not, this month's cover model and Men's Physique champion Sadik Hadzovic remembers a time, not too long ago, when he weighed just 140 pounds and didn't have a muscle on his body. In fact, he felt too tiny to even walk into a gym, so he started working out at home until he felt comfortable enough. And now in the past year alone, Hadzovic has placed second at the IFBB Olympia Men's Physique Showdown and won the Arnold Classic in March— the two biggest contests. In his quest to become the best, Hadzovic has come up with ways to push his body further than he ever did before. One way he has done this is with "The Redemption Workout," which you'll find on page 42.

Anton Antipov is another Men's Physique pro who has worked hard to achieve his goals, and it shows. Today, he's one of top competitors in the world, and it's in part because he has built his physique into the epitome of the classic V-taper. In "Anton Antipov's Ultimate V-Taper Workout" by Allan Donnelly on page 48, you can check out Anton's workout, as well as his 10 rules for achieving a classic V-taper physique.

Men's Physique Champion Jeremy Buendia became interested in Men's Physique when he started hearing about the new division in 2013. And he was clearly destined for greatness in that division, as he is the 2014 Olympia Men's Physique champion. It's clear the Jeremy trains hard, and he's been successful by keeping his rest periods short, and by using supersets and quad sets. In "The Perfect Physique! How Physique Olympia Champion Jeremy Buendia Plans to Keep His Title" by Ron Harris on page 60, check out Jeremy's back and chest workouts as well as his diets and tips for building the ultimate physique.

When viewed by prospective partners, a well-defined core in a man is a sign of sexual function. Great abs reveal an adherence to a healthy lifestyle, metabolic health, vascular function, hormonal sufficiency, strength and structural integrity— which all send the message to an interested party that you are capable of providing a satisfying sexual relationship. In "Better Abs, Better Sex: a Scientific Approach" by Daniel Gwartney, M.D. on page 56, find out more about the link between sex and having a ripped core, and how being fit can improve your sex life.

This month we are proud to announce two NEW columns in the magazine. The first is "Mr. Intensity" with fitness model and former football star Joe Donnelly on page 98. Joe will be answering reader questions in his column, so email him at Fitnsrx@gmail.com and you just might see your question answered in the next issue!

The second new column is "The M.A.X. Muscle Plan" by Brad Schoenfeld, Ph.D., CSCS, FNSCA on page 76. This month's column is titled "What is the Ideal Rep Range for Building Muscle?" Brad is one of the world's leading researchers and experts on muscle growth (muscle hypertrophy). Check it out to start maximizing lean muscle mass today.

The rest of the issue is packed with the latest cutting-edge scientifically backed research on training, nutrition and fat loss to build lean muscle and burn fat. FitnessRx is your number-one source for building muscle, losing fat, enhancing performance and staying healthy! And for more, don't forget to check out our website, www.fitnessrxformen.com.

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FITNESS RX for Men (ISSN 1543-8406)

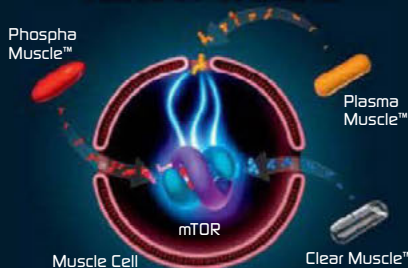
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SADIK HADZOVIC'S ROAD TO THE OLYMPIA

This month's cover model, Sadik Hadzovic, has his eyes on the biggest physique title in the world—the Men's Physique Olympia. Get a look at his workouts in this exclusive video series!



KILL IT LIKE KYLE

Former U.S. Army Captain and fitness model Kyle Clark takes you through some of his top workouts, exercises, intensity techniques and more. Get ready to kill it like Kyle! — the Men's Physique Olympia. Get a look at his workouts in this exclusive video series!



CARVE UP YOUR ABS WITH JOE DONNELLY

Joe Donnelly knows abs—and now you can, too. Check out Joe's top abdominal exercises and tips and get ready to build the six-pack you've always wanted.



ARTICLES



THE BLUEPRINT TO GAIN LEAN MUSCLE

Contributing expert Evan Shy lays out the game plan to help you pack on quality muscle in this four-week program designed to evaluate your strengths and weaknesses.



THE TOUGHEST, MOST EFFECTIVE SHOULDER WORKOUT EVER

Contributing expert Thomas DeLauer shares his ultra-intense, shoulder-blasting workout to help you fill out that T-shirt in no time flat.



4 STEPS TO KEEP LOSING FAT WHEN ALL HELL BREAKS LOOSE

We've all been in situations where the diet we have been so focused on gets thrown out the window due to circumstances outside our control. Here are four ways to make sure you get back on track to losing fat from Coach Paul Revelia. ■

Also Featuring:

- > Train with the Prez Cory Gregory
- > Alex Carneiro's Weekly Training and Nutrition Tips
- > And much more!

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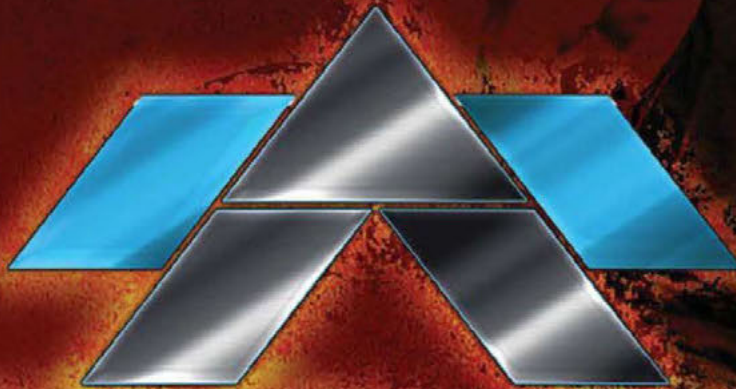
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FitRx WARM UP

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PG. 24 *COPING WITH*
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TRAIN FREQUENTLY FOR GREATER HYPERTROPHY

Whole-body workouts practiced three days per week were superior to split workouts emphasizing specific muscle groups one time per week while training three times per week—according to a study led by Brad Schoenfeld from CUNY Lehman College in New York. **The idea behind split routines is that they allow athletes to train specific muscle groups more intensely, while performing the same training volume.** Some believe they may promote muscle growth, enhance neuromuscular performance and prevent overtraining. This study showed that hitting muscle groups more frequently might produce more hypertrophy. The study used college students who were relatively untrained, so it is difficult to determine if the results apply to elite athletes. (Journal Strength Conditioning Research, published online April 30, 2015)

DON'T STRETCH BEFORE YOU LIFT!

Until recently, practically any exercise book recommended pre-exercise stretching as part of warm-up. Training experts thought that stretching increased range of motion and reduced the risk of injury during the subsequent workout. That's changed. Many studies have shown that static stretching before exercise decreases strength and power, and might actually increase the risk of injury. Marcos Sá from the University of Rio de Janeiro, Brazil, and colleagues found that static or ballistic stretching before weight training decreased strength endurance capacity during a weight-training program compared to a specific warm-up. This study was important because it showed that static stretching affects muscle endurance as well as strength and power. (Journal of Human Kinetics, 45: 177-185, 2015)



NO DIFFERENCE IN RECOVERY TIMES FOR EXPLOSIVE VS. HEAVY SQUATS

Some popular training programs use high-rep, low-weight (e.g., 40 percent of maximum) exercises performed explosively, while more traditional programs use heavier weights (e.g., 80 percent of maximum) and fewer reps. A study led by Eric Conchola and Brennan Thompson from Oklahoma State University found no difference in strength recovery between high-volume, explosive squats (five reps x 16 sets, 40 percent of maximum) versus high-intensity, slow-velocity squats (five reps x eight sets, 80 percent of maximum). There was a trend toward slower recovery in maximum power following the high-volume, explosive squats. (Journal Strength Conditioning Research, 29: 1285-1294, 2015)

IS OCCLUSION TRAINING EFFECTIVE FOR ATHLETES?

Occlusion or Kaatsu training involves exercising with restricted blood flow to the working muscles. Decreasing muscle blood flow may trigger cell damage, inflammation, cell stress and anabolic hormone release. Muscles grow in response to physical and chemical stress, so it seems reasonable that restricting blood flow to muscles during training might promote hypertrophy—according to researchers from San Francisco State University and California State University, Fullerton. Muscles can increase in size using low levels of resistance, provided they're pushed to near failure. Until recently, most muscle physiologists believed 60 percent of maximum effort was the minimum resistance for building muscle. Kaatsu training, however, achieves increases in strength and muscle mass at lower levels. Blood flow restriction during low-intensity weight training triggers muscle hypertrophy because it creates severe metabolic stress that stimulates muscle protein synthesis and hypertrophy. To date, only three published studies on Kaatsu used well-trained athletes. All of the studies were positive, which suggests that occlusion training might be effective in athletes. (Strength and Conditioning Journal, 37: 48-53, 2015)

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HIGHER STEP HEIGHT TRIGGERS GREATER BLOOD LACTATE CONCENTRATIONS

High blood lactate levels are linked to high-intensity exercise. They reflect the types of motor units recruited (i.e., slow-twitch versus fast-twitch) and blood lactate clearance capacity. A study by Brian Nguyen and Trevor Gillum found that performing a one-minute step test on a 40-centimeter high step resulted in greater blood lactate concentration than using a 20-centimeter step. The higher step required greater power and the recruitment of more powerful motor units, which resulted in greater blood lactate concentrations. (Journal Strength Conditioning Research, 29: 1578-1583, 2015)

INTERVAL TRAINING AND WEIGHT TRAINING BUILDS STRENGTH AND ENDURANCE

Loughborough University in the United Kingdom found that combining resistance exercise with HIIT activated the mTOR pathway and suppressed myostatin, which results in accelerated protein synthesis. Combining HIIT and weight training in a single workout is a good way to build strength and endurance simultaneously. (Physiological Reports, 3(4): E12364, 2015)

High-intensity interval training (HIIT) involves repetitions of short bouts of high-intensity exercise followed by rest. Endurance training interferes with strength training because it triggers different biochemical pathways leading to improvements in either strength or endurance.

HIIT is extremely intense and might not interfere with strength gains. British researchers led by Jamie Pugh from

COPING WITH OVERTRAINING

Coaches and athletes, in their quest for better performance, follow intense training programs in the hope of gaining an edge over the competition. However, a fine line exists

between programs that improve condition and those leading to overtraining. Overtraining is an imbalance between training and recovery. The consequences can be severe and include decreased performance, injury, depressed immunity and psychological depression. **Training programs must be intense enough to improve fitness and skill, yet provide enough rest to ensure adequate recovery.** Chronically overtrained athletes who get injured or crash may never reach their former levels of performance. Unfortunately, there is no single marker of overtraining. Instead, it is linked to a variety of symptoms that include decreased performance, overuse injuries, elevated resting heart rate, markers of muscle damage (i.e., creatine kinase), depressed testosterone, elevated or depressed cortisol, frequent illnesses, psychological depression and abnormal behavior. Hard work

is important for increased fitness, muscle mass and strength, but overwork leads to breakdown and failure. (ACSM's Health & Fitness Journal, 19 (2): 4-5, 2015)



ISOMETRIC TRAINING BUILDS CORE STIFFNESS

For more than 100 years, traditional core training included exercises such as sit-ups, back extensions and twists. Isometric core exercise might be a better way to develop core strength and stiffness. **Core stiffness is vital for athletes because it strengthens muscles, improves muscular endurance, reduces low back pain and boosts sports performance.** Greater core stiffness transfers strength and speed to the limbs, increases the load-bearing capacity of the spine and protects the internal organs during sports movements.

A landmark study by Benjamin Lee and Stuart McGill showed that isometric exercises for the core resulted in greater core stiffness than performing whole-body, dynamic exercises that activated core muscles. Isometric core exercises include planks, bird dogs, side-bridges, torsional buttress, pallof presses, stir-the-pot, carry exercises, inverted rows and cable wood chops. Dynamic core exercises included curl-ups, Supermans, side curl-ups, twisting curl-ups, advanced curl-ups, back extensions, Russian barbell twists, curl-up twitches, Superman twitches, lateral medicine ball throws and rotational medicine ball throws. The results of this study cast doubts on traditional core-training methods. This is an extremely important study that might change the way we train for sport. (Journal Strength Conditioning Research, 29: 1515-1526, 2015)



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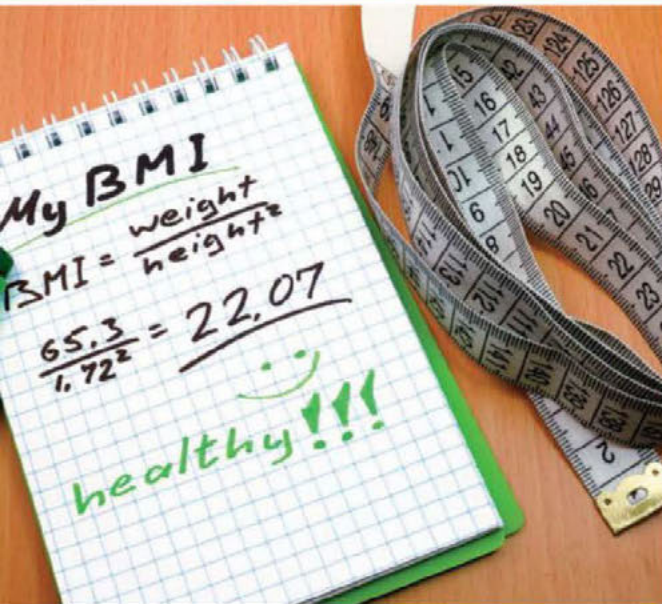
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BODY MASS INDEX: ITS USE AND DISUSE

Body mass index (BMI) is the most common method for quantifying body composition. It is defined as weight in kilograms divided by height in meters squared (Wt/h^2) and is a measure of the proportion of weight to height. A BMI between 18.5 and 24.9 is classified as desirable; 25 to 29.9 is overweight; and 30 and over is obese. It is widely used as a measure of fatness and as a risk factor for diseases such as coronary artery disease and diabetes. Unfortunately, BMI is a poor measure of the percent fat and a poor predictor of the risk of disease and premature death. For example, longevity is higher in people with "overweight" BMI compared to "ideal" BMI. A review of literature by Frank Nuttall from the University of Minnesota concluded that people of Western European extraction are heavier, taller and more likely to be overweight than people in other parts of the world. However, they are also healthier and live longer than any other period in history. He questioned the use of BMI as the cornerstone for defining the obesity epidemic. (Nutrition Today, 50: 117-128, 2015)

Substituting Protein for Carbs Promotes Long-Term Fat Loss

Glycemic load is a measure of how much a food increases blood sugar over time. Foods such as refined grains, starches and sugars have a high glycemic load and promote weight gain. Decreasing the glycemic load by increasing protein intake could have a significant effect on long-term weight control— according to a Harvard University study led by Jessica Smith. **Changing the dietary composition toward more protein and away from simple carbohydrates may be just as important as counting calories for weight loss.** Foods such as yogurt, seafood, skinless chicken and nuts are good choices for weight reduction. (American Journal of Clinical Nutrition, published online April 8, 2015)

ENERGY EXPENDITURE SLOWS DURING EXTREME CALORIC RESTRICTION

Ninety-Five percent of people who lose weight gain it back again within one year. One reason is that extreme caloric restriction slows metabolism and reduces caloric expenditure. Researchers from the University of Chile found that overweight women on calorie-restricted diets (20 calories per kilogram of bodyweight per day) reduced resting energy expenditure by 168 calories per day (10.6%). Resting energy expenditure was higher in women with more muscle mass. The study showed that the body adapts to caloric restriction by reducing energy expenditure, which makes it extremely difficult to maintain lost weight. (Nutricion Hospitalaria, 31:2428-2436, 2015)



HOT TUB THERAPY PROTECTS AGAINST INSULIN RESISTANCE

Sitting in a hot tub after a monster workout is one of life's great pleasures. Pain from sore muscles and joints seems to melt away. A review of literature by scientists from the Federal University of Rio Grande do Sul in Brazil found that heat therapy from a sauna or hot tub could help fight metabolic and cardiovascular disease. **Heat therapy reduces fasting blood sugar, glycated hemoglobin (a measure of long-term blood sugar control) and body fat.** It also increases nitric oxide secretion, which is an important chemical regulating blood flow. Heat therapy increases heat shock protein 70, which improves insulin sensitivity, prevents fat accumulation and suppresses inflammation. Sitting in a hot tub has measurable beneficial effects on health. (Current Opinion Clinical Nutrition Metabolic Care, 18: 374-380, 2015)



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EXERCISE BETTER THAN DIETING FOR IMPROVING METABOLIC HEALTH



Most studies show that effective weight loss requires cutting calories as well as exercising more. However, calorie cutting alone does little to improve metabolic health. Researchers from Changi General Hospital in Singapore compared weight loss and metabolic health in people attempting to lose weight through diet or exercise alone during a 24-week weight-loss study. Patients in both groups lost nearly eight pounds, but markers of inflammation and blood sugar regulation improved more in the exercise group. **Exercise is the most important way of improving metabolic health.** Trying to lose weight through caloric restriction alone is counterproductive for long-term health, appearance and longevity. (International Journal Sports Nutrition Exercise Metabolism, Published Online May 22, 2015)

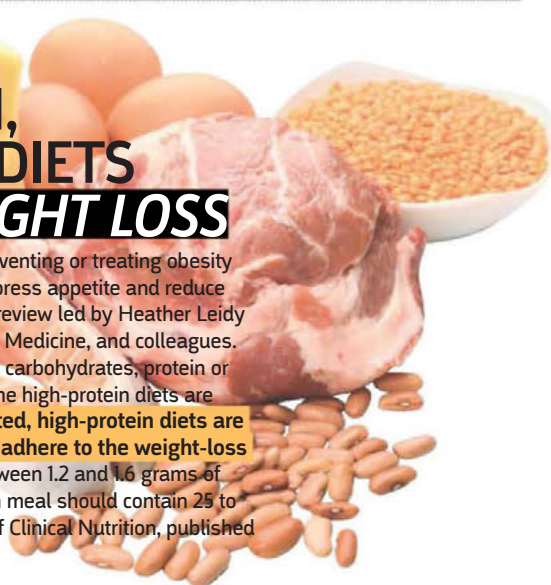
CHEMICAL IN APPLES PROMOTES FAT LOSS

Ursolic acid is a chemical found in apples, basil, cranberries, peppermint, oregano and prunes. It is used in a variety of cosmetic products and can inhibit the growth of some types of cancer cells. A Chinese study on rats found that ursolic acid supplements reduced bodyweight, increased caloric expenditure and decreased fat levels in muscle. Ursolic acid promoted fat loss by increasing the activity of uncoupling proteins in the cells, which causes fat loss by promoting heat formation. Ursolic acid is also anabolic. A University of Iowa study in mice found that ursolic acid found in apple peels prevented muscle deterioration following fasting and spinal cord injury. Ursolic acid supplements also increased muscle mass in normal mice. The anabolic effect of ursolic acid is caused by increased insulin signaling in skeletal muscle and the suppression of gene activity linked to atrophy (decreased muscle size). Ursolic acid might speed fat loss and build muscle. (Molecular Nutrition & Food Research, published online May 5, 2015)







HIGH-PROTEIN, LOW-CALORIE DIETS PROMOTE WEIGHT LOSS

High-protein diets are effective for preventing or treating obesity because they increase metabolism, suppress appetite and reduce caloric intake—according to a literature review led by Heather Leidy from the University of Missouri School of Medicine, and colleagues. Comparisons of weight-loss diets high in carbohydrates, protein or mixed nutrients consistently show that the high-protein diets are most effective for weight loss. **As expected, high-protein diets are most effective in people who actually adhere to the weight-loss program.** High-protein diets contain between 1.2 and 1.6 grams of protein per kilogram of bodyweight. Each meal should contain 25 to 30 grams of protein. (American Journal of Clinical Nutrition, published online April 29, 2015)



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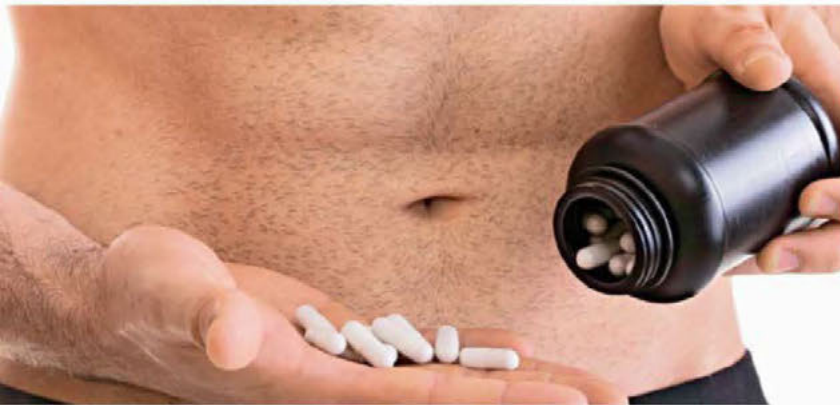
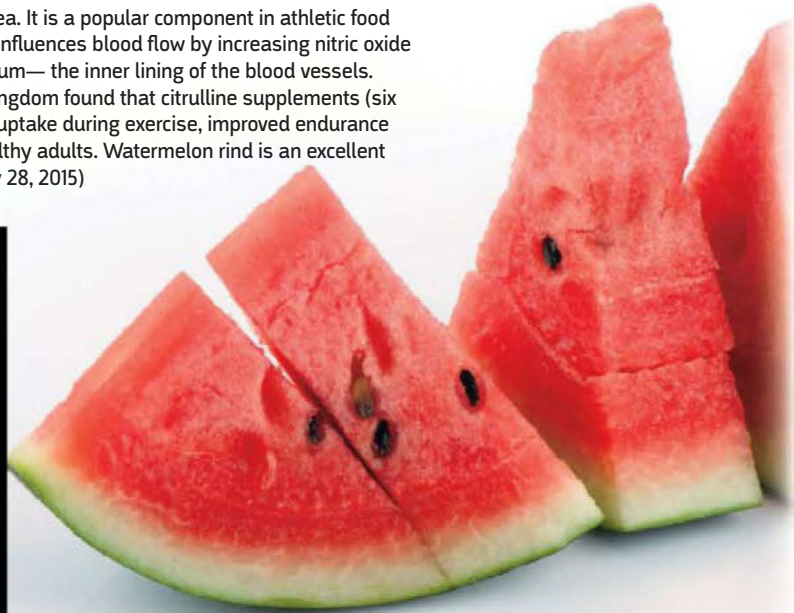
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L-CITRULLINE IMPROVES ENDURANCE PERFORMANCE

Citrulline is an important amino acid involved in the formation of urea. It is a popular component in athletic food supplements because it participates in key amino acid reactions and influences blood flow by increasing nitric oxide levels. Nitric oxide is an important chemical secreted by the endothelium—the inner lining of the blood vessels. Stephen Bailey and colleagues from Exeter University in the United Kingdom found that citrulline supplements (six grams per day) improved resting blood pressure, accelerated oxygen uptake during exercise, improved endurance performance and enhanced tolerance to high-intensity exercise in healthy adults. Watermelon rind is an excellent source of citrulline. (Journal Applied Physiology, published online May 28, 2015)

OMEGA-3 FATTY ACIDS FIGHT PROSTATE CANCER

A 2013 study led by Alan Krystal published in the *Journal of the National Cancer Institute* found that high blood levels of omega-3 fatty acids increased the risk of prostate cancer by 71 percent. Naturally, this study caused controversy in the supplement industry. A new study led by Kathryn Meier found just the opposite—the omega-3s EPA and DHA prevented prostate cancer cell growth. The study examined the effects of omega-3 fatty acids on cultures of prostate cancer cells grown in the laboratory. We do not know if these results apply to naturally living humans. (Journal of Pharmacology And Experimental Therapeutics, 352: 380-394, 2015)



Creatine Reverses Fatty Liver Disease

Fatty liver disease is a common problem associated with the obesity epidemic. It can cause severe health problems that begin with chronic fatigue, weakness, nausea, fluid buildup, jaundice and liver failure. The problem is linked to obesity, alcoholism, dietary choline deficiency and overtraining. A study on rats led by Rafael Deminice from Memorial University of Newfoundland, St. John's, Canada found that supplementing creatine monohydrate prevented fatty liver in animals fed choline-deficient diets. Creatine might be a simple way to prevent this serious health problem. (Journal Nutritional Biochemistry, 26: 391-397, 2015)

OMEGA-3 FATTY ACIDS IMPROVE PERFORMANCE

Polish researchers found that omega-3 supplements improved endurance capacity in cyclists by increasing concentrations of nitric oxide by eight micromoles per liter, and boosted muscle blood flow by over five percent compared to a placebo (fake omega-3s). This study agrees with several investigations from the University of Tokyo, which found that supplementing omega-3-rich fatty acids boosted exercise efficiency. Subjects took a daily dose of 3.6 grams per day of the omega-3s EPA and DHA. Omega-3 fatty acids—found in fish oil supplements, fish, walnuts, soybeans, beef and shrimp—promote blood vessel health and reduce the risk of heart attack and stroke. (Nutraingredients.com, May 6, 2015)



HIGH IRON LEVELS IN BRAIN LINKED TO ALZHEIMER'S DISEASE

Iron is an essential component of hemoglobin, which carries oxygen in blood. Many athletes take supplemental iron because they think it will boost oxygen transport capacity and endurance. This might be a mistake. High blood levels of iron have been linked to heart attack and stroke. **A study led by Scott Ayton from the University of Melbourne in Australia found that high ferritin iron levels in cerebrospinal fluid (brain fluid; CSF) were linked to the development of Alzheimer's disease.** People with a gene variant called APOE-e4 were particularly sensitive to increases in CSF iron. While iron deficiency is common in female athletes, most female and male athletes should avoid iron supplements. (Nature Communications, 6: article number 6760, May 19, 2015)

Tyrosine Boosts Brain Power

The brain and central nervous systems are the ultimate limiting factors of performance. The brain is the body's conductor that orchestrates movement, metabolic control and feelings of well-being. Tyrosine is an amino acid used by the brain to produce the neurotransmitters dopamine and norepinephrine, which are vital for controlling movements and optimizing energy levels. **A review of literature by Dutch scientists concluded that tyrosine supplements improve brain function after a single dose.** Long-term supplementation improved memory and information processing. Tyrosine works by preventing depletion of vital brain neurotransmitters related to central nervous system fatigue. (Pharmacology Biochemistry and Behavior, 133: 1-6, 2015)



BETA-ALANINE SUPPLEMENTS INCREASE PERFORMANCE DURING REPEATED PLYOMETRICS

Fatigue during high-intensity exercise is linked to acid buildup that interferes with chemical reactions necessary to continue exercise. Blood and muscles contain chemicals that buffer acids and prevent fatigue. Bicarbonate and alanine are two important buffers. Alanine is an amino acid that provides energy during exercise and prevents neuromuscular fatigue by increasing tissue carnosine levels. Carnosine is an important antioxidant that protects cells from destruction and buffers acids that cause fatigue. Alanine also helps supply energy during exercise. It is converted to blood sugar in the liver by a process called the glucose-alanine cycle. While alanine is not used to synthesize muscle tissue or enzymes, it influences exercise capacity—particularly endurance performance. **A study from Belgium found that supplementing beta-alanine (4.0 to 5.6 grams per day) for eight weeks improved performance of repeated squat jumps and counter-movement jumps by six to eight percent, compared to a placebo (fake alanine).** Beta-alanine caused a small improvement in repeated explosive power plyometrics. (Amino Acids, published online April 18, 2015)

Green Tea Extract Linked to Liver Toxicity

Green tea extract is an extremely popular supplement that people take to promote weight loss and increase energy levels. A study led by Herbert Bonkovsky from Wake Forest University School of Medicine reported that a chemical called epigallocatechin gallate (EGCG) is toxic to the liver when taken in high doses. They reported that at least 20 cases of liver injury have stemmed from green tea extract supplements. They stated, however, that these findings do not apply to consumption of green tea because the EGCG levels do not approach those found in green tea extract supplements. We are in the dark about the dangers of herbal products such as green tea extract. While people from China have consumed green tea for centuries, it is only recently that we have been able to concentrate key ingredients in herbal products. (NeutraingredientsUSA.com, May 12, 2015)

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Athletes Should Pay Close Attention to PROTEIN INTAKE

Protein is a critical dietary component that can pay big dividends if managed correctly in the diet. Researchers from the University of New Mexico led by Kurt Escobar summarized the importance of protein in the active athlete's diet. If you want to increase muscle, you should consume close to 1.5 grams of protein per kilogram bodyweight per day. Consuming protein shortly before or after workouts enhances muscle protein synthesis. Co-ingesting carbohydrates with protein increases muscle protein synthesis and provides fuel for glycogen re-synthesis and skeletal muscle and the liver. **Consuming 25-gram doses of protein throughout the day stimulates a more consistent increase in muscle protein synthesis.** Elevated protein intake works best when combined with intense weight training. Finally, increased protein intake helps maintain lean muscle mass when trying to lose body fat. (Strength and Conditioning Journal, 37: 23-34, 2015)

Should You Eat Eggs?

Classic scientific studies, such as the Framingham and Seven Countries studies, showed that elevated blood cholesterol was linked to heart attack and stroke. Eggs are unusually high in cholesterol, so they were blamed for a good portion of the heart disease in America. Frank Sacks from Harvard University said that saturated fat in foods was more important than cholesterol for boosting blood cholesterol and that eggs were unfairly blamed for the high rate of heart disease in America. While eggs are experiencing a nutritional renaissance, other studies show that eggs are not a risk-free food. **People with diabetes who ate one egg a day increased their risk of heart disease by 44 percent compared to people who only ate one egg per week.** Egg eaters are also more likely to get prostate cancer. Most mainstream nutritionists recommend that people follow healthy dietary patterns that include increased consumption of fruits, vegetables, whole grains, low-fat dairy, seafood, beans and nuts. People should also consume alcohol moderately, reduce intake of red and processed meats, and reduce consumption of high sugar foods. Eggs can be part of a healthy diet. (Nutrition Action Health Letter, June 2015)



PALEO DIET Improves Blood Fats

The Paleolithic or Caveman Diet is based on consuming berries, nuts, lean grass-fed meats and fish. Proponents of the diet claim that human genes evolved over thousands of years to optimize metabolism from eating these natural foods. Industrialization changed the human diet suddenly to include the consumption of grains and calorie-dense, high fat, processed foods. Food choices also increased dramatically, which promoted overeating and overconsumption of unhealthy foods. Researchers from Eastern Michigan University found that middle-aged adults consuming a Paleolithic diet low in grains experienced substantial decreases in total cholesterol, LDL cholesterol, triglycerides and increased HDL (the good cholesterol). These changes occurred after they had first consumed a traditional cholesterol-lowering diet. Critics of the Paleolithic diet point out that the diets of ancient humans varied greatly from one place to another, so that it is unlikely that metabolically linked genes adapted uniformly. (Nutrition Research, 35: 474-479, 2015)

Olive Oil Basics

Olive oil is the basis for the Mediterranean diet, which is linked to increased longevity, decreased obesity and a reduced risk of heart disease. Nancy Jenkins summarized essential knowledge about olive oil to help you get maximum enjoyment from this wonderful food. Buy olive oil in dark glass containers or tins that have been protected from the sun. The best olive oil is usually the most expensive and high-end labels usually contain the best quality oils. Fresh olive oil is best, so try to use it within 18 months of bottling. It's OK to heat olive oil above 250 degrees and use the oil for baking because olive oil is more stable than other oils. Finally, the best olive oil is low in omega-3 fatty acids. The health benefits come from their antioxidant polyphenols. Olive oil is a heart-healthy food that adds flavor to many dishes. Try to buy only the best. (The Wall Street Journal, May 15, 2015)



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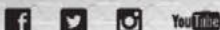
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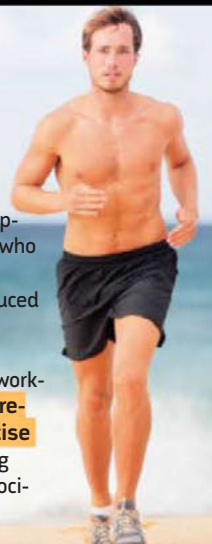
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CHERRY JUICE Reduces Upper Respiratory Problems After Marathon Run

Upper respiratory infections are common following competitive marathon running. Extreme levels of exercise cause general body inflammation and suppress the immune system. British researchers found that marathon runners who took cherry juice after a race showed reduced inflammation as measured by levels of C-reactive protein, immunoglobulin A, immunoglobulin B, and a reduced incidence of upper respiratory infections compared to a placebo (fake cherry juice). Cherry juice is the real deal for protecting muscle tissue from damage during intense exercise ranging from marathons to monster weight-training workouts. **Chemicals in cherry juice, such as flavonoids and anthocyanins, prevent muscle oxidative damage and inflammation associated with exercise recovery.** Cherry juice might be useful for reducing sports injuries, preventing upper respiratory infections and promoting recovery. (Journal International Society Sports Nutrition, 12:22, 2015)



CAPSAICIN Protects Liver Cells

Capsaicin, the chemical that makes chili peppers hot, promotes weight loss and reduces fat deposition by increasing key proteins in fat cells. It might also protect liver cells from fibrosis. **A study from Belgium on mice found that supplementing their diets with capsaicin prevented liver cell fibrosis following closure of their bile ducts.** Liver fibrosis is common in obesity and can occur with longtime use of anabolic steroids. Capsaicin supplements might protect liver function in those who use anabolic steroids. This is speculation because no one has studied this directly. (Molecular Nutrition & Food Research, 59: 1107-1116, 2015)



OMEGA-3 FATTY ACIDS Improve Endurance

Omega-3 fatty acids—found in fish, walnuts, soybeans, beef and shrimp—promote blood vessel health and reduce the risk of heart attack and stroke. Polish researchers found that omega-3 supplements improved endurance capacity in cyclists by increasing concentrations of nitric oxide by eight micromoles per liter, and boosting muscle blood flow by over five percent compared to a placebo (fake omega-3). **This study agrees with several investigations from the University of Tokyo, which found that supplementing omega-3 rich fatty acids boosted exercise efficiency.** Subjects took a daily dose of 3.6 grams per day of the omega-3s EPA and DHA. (European Journal of Sports Science, 15: 305-314, 2015)

Higher Nut Consumption Linked to Reduced Heart Attack Risk

Nuts are considered heart-healthy foods. However, most studies showing the nutritional value of nuts used people in higher socioeconomic groups of European descent. A study from Vanderbilt University School of Medicine in Nashville, Tennessee showed that higher nut consumption was linked to a reduced rate of death from all causes and from cardiovascular disease, in a sample of more than 200,000 people of low socioeconomic status. The results were consistent for blacks, whites and Asians. Peanuts were the most prevalent form of nut consumption. Eating more peanuts might be a cost-effective way of improving cardiovascular health in various socioeconomic groups. (Journal American Medical Association Internal Medicine, 175: 755-766, 2015)



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When Do Men Need Testosterone Supplements?

Low testosterone levels make men feel rotten! Symptoms include fatigue, depression, loss of energy, decreased sex drive, abdominal obesity, poor blood sugar regulation and erectile dysfunction. Low blood levels of total testosterone are not enough to warrant testosterone supplements—according to Shehzad Basaria from Harvard Medical School. Diagnosis requires two separate measurements of total testosterone, measurement of serum hormone-binding globulin and free testosterone to determine if symptoms are due to low testosterone levels or something else. The normal range for total testosterone is 300 to 900 nanograms per 100 milliliters of blood. Many anti-aging specialists believe that middle-aged and older men should have testosterone levels of 800 to 900 for optimal health and well-being. (Journal American Medical Association, 313: 1749 - 1750, 2015)



WEIGHT TRAINING IMPROVES SLEEP QUALITY

Inadequate sleep and poor sleep quality are linked to premature death, cardiovascular disease, diabetes and abdominal obesity. Regular endurance training improves sleep quality. Scott Collier, Jessica Alley and co-workers from Appalachian State University in North Carolina found that weight training helped people go to sleep faster and improved sleep quality. When they trained (morning, afternoon or evening) had no effect on sleep structure or nighttime blood pressure. **People need six to eight hours of good-quality sleep per night for optimal health.** They concluded that weight training might be particularly beneficial for promoting sleep in people with bone or muscle loss, and those with psychological disorders. (Journal Strength Conditioning Research, 29: 1378-1385, 2014)

Core Training Effective for Reducing Back Pain

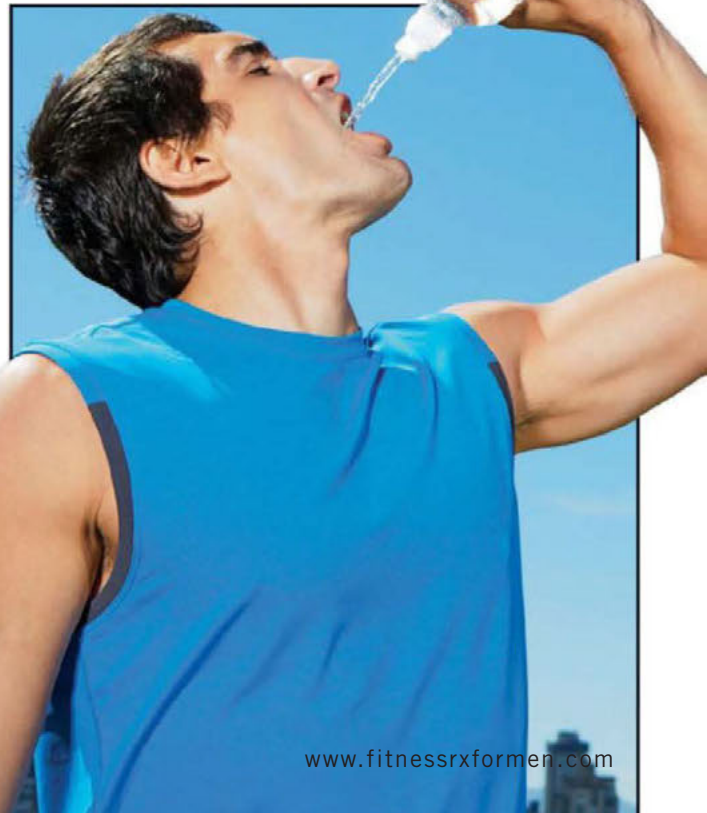
The core muscles in the torso provide a stable midsection vital to all motions and postures. The core muscles stabilize the spine and help to transfer force between the lower and upper body. They stabilize the midsection when you sit, stand, reach, walk, jump, twist, squat, throw or bend. **A meta-analysis by researchers from Taiwan showed that strengthening core muscles, particularly deep muscles such as the quadratus lumborum, make movements more forceful and preserve a healthy spine to help prevent back pain.** They tone muscles without damaging the fragile spinal disks and will give you a lean, toned midsection and functionally strong core muscles that work together flawlessly to maintain a pain-free spine that hopefully will last a lifetime. (Journal Physical Therapy Science 27: 619-622, 2015)

TRAINING AND COMPETING IN THE HEAT

A distinguished group of international environmental physiologists made recommendations for exercising in the heat:

- Athletes should acclimatize to heat by training in hot climates for at least 60 minutes per day for two weeks.
- Tank up before training or competing in the heat by drinking six milliliters per kilogram of bodyweight every two to three hours until normally hydrated.
- Minimize weight loss during prolonged exercise in the heat by replacing fluids appropriately.
- Increase sodium intake when training or competing in the heat.
- Rehydrate after exercise by consuming enough fluids and electrolytes to offset 100 to 150 percent of lost weight. Rehydrating regimens should include sodium, carbohydrates and protein.
- Cooling methods include wearing ice garments, cold towels, water immersion and ingestion of cold fluids or ice. Precooling may benefit athletes involved in prolonged exercise.

Acclimatization, hydration and cooling are vital skills for athletes competing in the heat. (Scandinavian Journal Medicine Science Sports, 25 (Supplement 1): 6-19, 2015)



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TABLETS AND SMARTPHONES ARE ROBBING YOU OF SLEEP

In 1900, people slept nine hours a night. That declined to seven hours a night in the 1970s and decreased further until today. Inadequate sleep is linked to poor concentration, anxiety, loss of energy, decreased learning ability, reduced attention to detail and motor vehicle accidents. How did sleep, which came so naturally, suddenly become a crisis? What is the smoking gun that explains modern sleep problems? Scientists found that the culprit is an unusual suspect hiding in plain sight—smartphones, tablets, backlit e-readers and computer screens. These devices emit light, particularly blue light that disturbs biochemical processes that promote sleep. They also increase exposure to electromagnetic radiation, which is linked to insomnia, headache and confusion. **The radiation from cell phones interferes with brain centers that secrete hormones and influence many aspects of body function.** Our bodies pay a price from surrounding ourselves with fancy smartphones, tablets and light-emitting gadgets—the price is lost sleep. (Proceedings National Academy Of Sciences, USA 112: 1232-1237, 2015)



Moderate Coffee Consumption Is Good for Health

Drinking coffee has been labeled as an unhealthy practice for more than 100 years. Some religions discourage coffee drinking because it's considered a vice. More than 36 high-quality medical studies found the opposite—moderate coffee consumption reduces the risk of cardiovascular disease, liver disease and diabetes, and has no effect on the risk of various kinds of cancer. Coffee reduces the risk of Parkinson's disease and prevents mental decline with age. Most important, coffee drinking is linked to increased longevity. Coffee is an important part of a healthy diet. (The New York Times, May 14, 2015)

The Environmental Working Group Blasts Sunscreens

The Environmental Working Group is an environmental think tank based in Washington, D.C. that attempts to protect the public from environmental toxins, promote healthy nutrition and expose questionable consumer products. Each year, they publish a report on sunscreens and their effects on preventing skin cancer and premature skin aging. They concluded that sunscreens do not prevent melanoma, the most deadly form of skin cancer. Sunscreens with a high sun protection factor (SPF) encourage people to stay out in the sun too long. Most sunscreens contain vitamin A additives, which may speed the development of skin cancer. European sunscreens contain more UVA ray-filtering chemicals and better protect the skin than American products. Most people don't use enough sunscreen and don't apply it often enough to protect from skin damage.

Some sunscreens contain chemicals that disrupt hormone regulation. You can get a copy of the report from The Environmental Working Group's website, www.ewg.org. (EWG's Guide to Sunscreen, published online May 2, 2015)



WHY MORE PEOPLE GET SICK IN THE WINTER

Rates of colds, flu, heart attack, stroke, autoimmune disease and psychiatric illnesses are much higher in the winter than in the summer. **Researchers from University of Cambridge in the United Kingdom found increased activity levels of genes controlling the immune system during colder times of the year.** They examined immune system activity in the United Kingdom and Gambia (located in Africa) during different seasons of the year. Inflammation, which is linked to poor metabolic health and the long-term risk of heart attack and stroke, was higher during the colder months. The cold months of the year can be dangerous for your health. (Nature Communications, published online May 12, 2015)



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● BY STEVE BLECHMAN AND THOMAS FAHEY, EdD

No Link Between PORNOGRAPHY and Sex Problems in Young Men

Erectile dysfunction is an epidemic in men under 40. Is easy access to pornography on the Internet the cause? Live porno webcams and videos bring porno on demand to computers, tablets and smartphones. Researchers from the University of Zagreb in Croatia found no relationship between pornography use and sexual desire, erectile function or the capacity for orgasms in a sample of men living in Croatia, Norway and Portugal. Factors such as physical inactivity and insulin resistance may account for the surge in erectile dysfunction in young men. (Journal of Sexual Medicine, 12: 1136-1139, 2015)



CAFFEINE Makes You Hard

Caffeine, found in coffee, chocolate, tea and supplements, increases strength, power and endurance. It might also improve sexual performance. **David Lopez from the University of Texas-Houston School of Public Health, and co-workers, found that men who consumed the most caffeine showed the lowest risk of erectile dysfunction.** The researchers examined more than 3,700 men who participated in the National Health and Nutrition Examination Survey (NHANES). The data was obtained from 24-hour dietary recall and was consistent among lean and obese men. However, the relationship did not exist in men with type 2 diabetes. Caffeine might improve athletic and sexual performance.

(PLoS ONE, 10(4): E0123547, 2015)

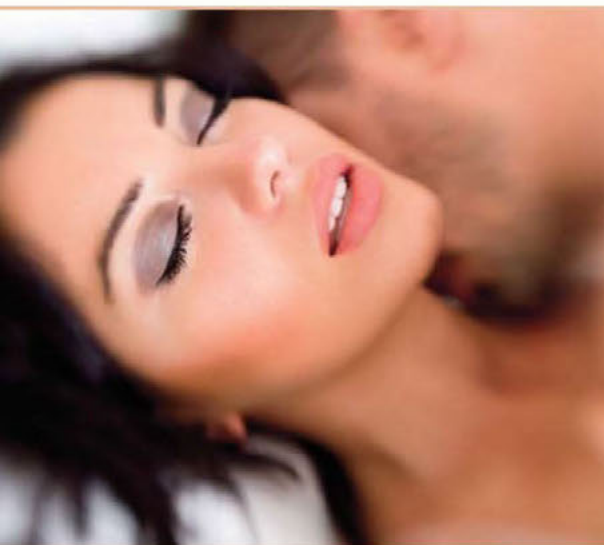


A Bug's Life: SIZE MATTERS

Women often say that size doesn't matter. They are more concerned with what's in a man's heart. That's not true in the animal kingdom and it's probably bullshit in people, too. British researchers, led by Liam Dougherty from the University of St. Andrews, found that reducing penis length in seed bugs (*Lygaeus simulans*) by 30 percent reduced their frequency of sexual activity. These insects are unique because their penises are 70 percent of their body length. If people had similar proportions, a six-foot tall man would have a four-foot-long penis. Studies show consistently that women prefer penises about 6.5 inches long. Most women choose girth over length because it puts more pressure on the clitoris. The study showed that penis size is as important in seed bugs as it is in humans. (Proceeding of the Royal Society B, published online

FDA Committee Approves 'VIAGRA FOR WOMEN'

Forty percent of women suffer from low sexual arousal, which causes significant anxiety and concern in women and men. **In early June, an advisory committee of the U.S. Food and Drug Administration (FDA) approved the use of flibanserin (Sprout Pharmaceuticals) for treating hypoactive sexual desire disorder in women.** Clinical studies found that the drug increased sexual desire and the frequency of satisfying sex. It is a non-hormone drug that works by stimulating the brain's centers for motivation and rewards. Side effects, such as dizziness, nausea and sleepiness, have prevented FDA approval in the past. Men have drugs such as Viagra, Cialis, Levitra and testosterone for boosting sexual performance, but sexual problems are more complex in women than men. Contributing factors to low sexual desire in women such as stress, relationship problems, difficulty reaching orgasm, loss of intimacy and poor metabolic health are not cured easily by a pill. (The New York Times, June 4, 2015)



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Missionary Position Places Least Stress on the Spine in Women

Sex is an enjoyable and essential part of a healthy lifestyle, but a sore back takes the fun out of it. Eighty-five percent of men and women will have back pain at some point in their lives. Back expert Stuart McGill from McMaster University in Canada, and co-workers, found that doggy-style sex was the least stressful to the male spine, while the missionary position was least stressful to the female spine. The researchers measured spinal biomechanics during sex using two missionary positions, spooning and two forms of doggy style. Doggy style with the woman's arms outstretched put the male spine in an upright, neutral position, which placed the least stress on spinal nerves and disks. As a compromise, doggy-style sex with weight supported on the forearms was best for minimizing spinal stress in men and women. (European Spine Journal, 24: 513-520, 2015; Spine 39:1633-1639, 2014)

PREMATURE EJACULATION EXPOSED

Premature ejaculation (PE) is the most significant sexual problem in men. It occurs in people of all ages, races and educational levels, but is most prevalent in men aged 18 to 40. The problem is more serious in men who are divorced, separated or widowed than in men who are married or who never married. College graduates are 35 percent less likely to suffer from PE than high school dropouts, and Hispanics are less likely to have the problem than



whites, blacks or Asians. Risk factors include past history of sexually transmitted diseases or urinary tract infections, poor health, emotional stress, loss of income, past history of same-sex activity, history of sexual harassment and childhood abuse. Factors decreasing the risk include daily alcohol consumption, circumcision and greater sexual

experience. Men with strict religious backgrounds who view sex as a sin or lack attraction for their partner also have an increased risk of PE. Physical factors can play a role. These include abnormalities in the pelvic floor muscles, hypersensitivity of the head of the penis, overstimulation of the genitals from the brain, side effects of drug use (amphetamine, cocaine), urological diseases and neurological diseases (multiple sclerosis, peripheral nerve disease). Treatment for PE is difficult because of the complexity of the problem. (Journal of Sexual Medicine, 12: 1175-1183, 2015)

FREQUENT EJACULATION Reduces the Risk of Prostate Cancer

Prostate cancer is the second most common cancer in American men (skin cancer is first). In 2015, cancer experts expect about 220,800 new cases of prostate cancer and 27,540 deaths from the disease. About 14 percent of men will be diagnosed with prostate cancer during their lifetimes. While regular exercise and consuming a healthy diet might reduce the incidence of the disease, scientists can't really point to any modifiable risk factors—until now. A study led by Jennifer Rider from Harvard University found that frequent ejaculation reduced the risk of prostate cancer. Researchers followed about 32,000 men for 18 years. Nearly 4,000 men developed prostate cancer and 384 of them died. Men who ejaculated 21 times a month reduced their risk of the disease by 20 percent. The most frequent ejaculators in the study were divorced men in their 40s. The best way to prevent prostate cancer is to have more sex—with a partner or by yourself. (Paper presented at the American Urological Association Annual Meeting (abstract PD6-07), May 15, 2015)



Regular, INTENSE EXERCISE Reduces the Risk of Erectile Dysfunction

Erectile dysfunction (ED) is an early warning sign of heart attack. Poor blood vessel health impairs the ability to secrete a chemical called nitric oxide, which controls blood flow to the penis. Regular physical activity is the most important way to promote metabolic health and healthy sexual function. A study led by Adriana Vidal from Cedars-Sinai Medical Center in Los Angeles found that men who exercised intensely have a lower incidence of erectile dysfunction. Intense exercise was defined as greater than or equal to 18 met hours per week, the equivalent of walking 60 minutes, six times per week or jogging 30 minutes, five times per week. These results were consistent in white and black men. (Journal of Sexual Medicine, 12: 1202-1210, 2015)



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PUSH YOUR BODY TO THE MAX WITH SADIK HADZOVIC'S MUSCLE-BUILDING, TOTAL BODY-BLASTING ROUTINE



We all struggle to find motivation at times. Despite having one of the best physiques in the world, Sadik Hadzovic is no different.

To regain his proverbial Eye of The Tiger, though, Hadzovic doesn't have to look very hard. He just needs to look in the mirror and remember the image that was looking back less than a decade ago.

"I weighed about 140 pounds and didn't have a muscle on my body," Hadzovic recalls. "I felt like I was too tiny, that I didn't even belong in a gym. So my short-term goal was just wanting to get big enough where I had the confidence to join one."

That's right, people. There was a time— not very long ago, either— when Hadzovic couldn't muster up the courage to walk into a gym and put his rail-thin body on display.

But opportunity comes in many shapes and sizes, and Hadzovic's came in the form of a neighbor who was moving out of his home. That neighbor asked Hadzovic and his brother to help and, in return, paid them \$200. Only Hadzovic wasn't in the sharing mood.

"It was supposed to be \$100 for me and \$100 for my brother," he says. "But instead of telling my brother, I took it all for myself and went to Kmart and bought a bench press [set] and a pair of 35-pound cast-iron dumbbells— just hoping to get big enough to get comfortable to join a gym."

One year, and 10 pounds later, that's exactly what Hadzovic did. And he hasn't let up since.

Today, at 27 years old, Hadzovic has transformed his body into one of the most impressive in the fitness world, a fact that is illustrated by his success in the professional ranks. In the past year alone, Hadzovic has placed second at the biggest competition in the world (the IFBB Olympia Men's Physique Showdown in September of 2014) and won the second biggest (the Arnold Classic in March). This brings us to his current primary source of motivation.

THE REDEMPT



BY ALLAN DONNELLY

TRAINING PHOTOGRAPHY BY IAN SPANIER
PHYSIQUE PHOTOGRAPHY BY GREGORY JAMES

TION **WORKOUT**

“Ever since I placed second at the Olympia, it’s been a mix of emotions,” Hadzovic says. “Obviously angry, but at the same time I saw it as a blessing in disguise because it allowed me to look at my training and diet and really fine-tune everything—to think back at times and say, ‘OK, well, I could have done a little bit harder in the gym, or done more cardio.’”

“Since then I can honestly say I haven’t missed a day of training, I’ve calculated every meal, every drop of water and every grain of rice has been accounted for. It has lit a fire under my ass because I can see what it is to be the best in the world, and to be the best in the world you have to be perfect. That’s why so few people can say that.”

In that quest to become the best, Hadzovic got creative, coming up with ways to push his body further than he had before. One of those ways? Hadzovic’s “Redemption Workout.”



THE WORKOUT

“The mindset for this workout is pretty much that of redemption,” Hadzovic says. “I came up with this because, when things don’t exactly go your way, you can either complain about it or you can use it to better yourself and take your training to the next level. I knew by doing this, it was something none of my competitors are doing.”

“This is something people can do to break away from the conventional chest Monday, back Tuesday, legs Wednesday routine. That’s good and all, but it gets repetitive and boring. Once in a while you just have to get in the gym and kind of fall in love with the process again of really challenging yourself.”

The workout essentially consists of performing supersets with heavy, compound movements and high-intensity sprint intervals—making it both a muscle-building and cardiovascular session at the same time. You’ll perform the supersets with antagonistic muscle groups like back/chest and biceps/triceps.

“Training that way, I noticed that it created a huge anabolic response in my body and encouraged me to grow,” Hadzovic says.

For example, the first superset/sprint cycle will look like this:

Bent-over Dumbbell Row x 15
Immediately move to:
Incline Dumbbell Press x 15
Immediately move to:
400-meter Sprint

Since most gyms don’t have an outdoor area where you can sprint for 400 meters, Hadzovic recommends using a treadmill and setting it at 10 mph for one minute at an incline anywhere between 7 and 9. After your sprint, you can rest—but not for long.

“Ideally, there is no rest,” Hadzovic says. “Just when you are walking to the treadmill and then to the next exercise. That’s typically around 30 seconds. I prefer anywhere between 15 to 30 seconds maximum.”

Once you’re done with a superset/sprint combo, you’ll move immediately to the next circuit. Since there is so little rest, you’ll keep your rep ranges higher than what you are likely used to, except for on deadlift—which means you’ll need to go lighter than normal in order to reach that number.

“I recommend using about one-fourth of your one-rep max on most exercises,” Hadzovic says. “For instance,

TODAY, AT 27 YEARS OLD, HADZOVIC HAS TRANSFORMED HIS BODY INTO ONE OF THE MOST IMPRESSIVE IN THE FITNESS WORLD, A FACT THAT IS ILLUSTRATED BY HIS SUCCESS IN THE PROFESSIONAL RANKS.



REDEMPTION WORKOUT DIET

Meal 1 – 9 egg whites, 1 yolk, ½ cup oatmeal
Meal 2 – 8 oz steak, 8 oz red potato
Meal 3 – 7 oz chicken breast, 6 ½ oz white rice
Meal 4 – 1 GAT Supertein shake
Pre-Workout – 1 scoop GAT Nitraflex
Intra-Workout – 1 scoop GAT Muscle Martini
Post-Workout – 1 scoop GAT JetMass
Meal 5 – 7 oz salmon, 6 oz broccoli
Meal 6 – 10 egg whites, 1 tbs almond butter



for the squat I'm doing one plate on each side, which is a lot less than what I'll normally use."

Keep in mind that this is a high-intensity, maximum-effort, total-body workout that will tax your entire system. Hadzovic recommends using this workout simply as a means to break up the monotony of your normal routine and to jump-start a new level of growth.

"You can't possibly do this workout more than once or twice a week, maximum," he says. "I recommend once a week or every other week. Do this workout on special days when your routine is getting old and boring. If you're doing the same thing all the time, you have to switch it up and reward—or punish—yourself."

THE SUPERSETS

SUPERSET 1

Complete 3 times

- Bent-over Dumbbell Row x 15
- Incline Dumbbell Press x 15
- 400-meter Sprint

Sadik Says: "On the dumbbell row, I like to get my upper body completely parallel with the ground. For me, that's the most effective way to target my lats, pull the weight more toward my belly button rather than higher up. I'd love to tell you to squeeze at the top as much as you could, but it's not really realistic with this workout—this is all about getting it done while trying not to die!

"For incline dumbbell presses, I always prefer to use a 30-degree incline since my front delts have always been so overpowering. If your upper chest is lacking, that's what I recommend to activate the chest a little more and take tension away from the shoulders."

SUPERSET 2

Complete 3 times

- Front Squat x 15
- Hanging Leg Raise x 15
- 400-meter Sprint

Sadik Says: "A lot of people talk about foot positioning on squats—shoulder width, closer

or wider. What I've found most effective is to do what's most comfortable. The whole thing with this movement is to target your quads and the glutes, but I like to put the emphasis on breathing during the movement. Inhale, exhale and activate the abdominal muscles. That's why these are paired with hanging leg raises—because after 15 reps of front squats, your abs should be a little bit tight. I like to further target the lower abs with those, keeping the emphasis on my breathing. Also, it's important not to swing; don't use momentum to get your legs up."

SUPERSET 3

Complete 3 times

- Standing Barbell Curl x 12
- Chain Weighted Dip x 15
- 400-meter Sprint





Sadik Says: “I’ve seen tremendous mass improvements in my biceps with barbell curls, but also with the peak of the muscle. The most important part of this exercise is to focus on the negative on the way down. Explode up, but on the way down take a minimum of three seconds.

“On dips, make sure to keep your upper body more upright to target the triceps—if you lean too far forward you’ll hit more of the chest. I prefer to use the chain over the belt because I like the feel of it, and it also helps with keeping your upper body upright more than the belt.”

SUPERSET 4

Complete 3 times

- Deadlift x 6
- Walking Lunge x 15
- 400-meter Sprint

Sadik Says: “There’s really no rhyme or reason why deadlifts are last—I just wanted to think of the most grueling way to end the workout. Mentally, physically—it’s about just feeling like you’re going to die but will do anything to push through that, just a continuation of the Redemption theme. The reps are lower here because your energy is going to be low, but you can go a little heavier.

“With walking lunges, just go as far as your gym allows you to. If you have the space, don’t do more than 15 for each leg.”

BIO BOX

Name: Sadik Hadzovic

Age: 27

Weight: Off-season 205 lbs, Contest 190 lbs

Height: 5’11

Hometown: Westbury, NY

Sponsor: GAT Nutrition



THE PERFECT PHYSIQUE

Sadik will be appearing in the documentary “The Perfect Physique,” which is set to premiere at the Toronto Film Festival in September. Directed by Kandice King, the documentary takes a look at the world of Men’s Physique competitors and models and also stars Jeremy Buendia, the late Greg Plitt, Jason Poston and more.



**ANTON
ANTIPOV'S ULTIMATE**

V-TAPER

WORKOUT

And 10 Keys To A Superhero Build

Ask most guys what inspired them to get into the weight room in the first place and you'll get any number of different answers—seeing Arnold Schwarzenegger or Dwayne Johnson on the big screen, picking up a Superman comic book or following in their father's footsteps all rank fairly high on the cliché list of answers.

But ask them what image they had in their heads when they went—the vision of their ideal physique—and the answers will likely be much more similar.

THE CLASSIC V-TAPER

From the gladiators of ancient Rome to the sculptures of Michelangelo, to Steve Reeves as Hercules in the 1950s, to any number of superhero actors in today's Marvel Universe, it's a look that has stood the test of time for thousands of years—and it's the same regardless of where you come from.

Just ask IFBB Men's Physique Pro Anton Antipov, a Nutrex athlete. Growing up in Belarus, Russia as the son of an artist, Antipov was inspired by his father's sketches at an early age.

"He drew a lot of comic book characters, but his thing was cowboys and Indians," Antipov

remembers. "But he still drew these characters with proportional structures, so he had to learn anatomy as well. When I got a little older he gave me his sketching books, so I started drawing and doodling around myself."

Those sketches served as Antipov's introduction and inspiration to the classic superhero physique—broad, round shoulders tapering down to a small, chiseled midsection. And even though Antipov was undersized for most of his teenage years, it's a look that stayed in his mind as something to strive for when he moved to the United States and started training at his friend's basement gym in Brooklyn.



"I was really into it," Antipov says. "I was training in his basement even when he wasn't. After a while I needed more—it was very limited—so I joined a gym and took the next step. It doesn't really matter where you train as long as you have weights—if you have the drive you can really make it work anywhere."

Antipov is proof of that. Even though he still trains at that same Brooklyn gym he joined 10 years ago, his physique has grown by leaps and bounds. Today, he's one of top physique models and competitors in the world, and it's no secret why—he has built his once spindly physique into the epitome of the classic V-taper.

And if he can do it, so can you. Take a look at Antipov's 10 Rules for the Classic V-Taper Physique and the workout that helped him get there, and who knows—someday you might look like a real-life superhero, too.



SMITH MACHINE MILITARY PRESS

"I like the Smith machine because I don't have to worry about balancing as much. I can focus more on the tension and the contraction, on keeping my elbows in one position, whereas with the free bar it's a lot more difficult to keep my elbows in one place."

ONE-ARM MACHINE PRESS WITH STATIC HOLD

"I bring both arms up so my elbows and shoulders are aligned and hold them there. Then I press up with one arm while holding the other one static so tension always stays on the shoulder, rather than bringing both arms up and resting on the bottom. It's a limited range of motion but I like the amount of tension you can put on the shoulder better than any other exercise."

RULE #1: TRAIN SHOULDERS OFTEN

If you want to build up your shoulders, you're going to have to hit them more than once a week. "I don't do it anymore because my shoulders tend to overpower everything else," Antipov says. "But I got them this way by training them two to three times a week. If you don't have the luxury of training them more than once a week, throw in a set of heavy military presses at the end of another body part."

RULE #2: DON'T BE A REP COUNTER

This one may take some getting used to—it took Antipov 10 years—but it's why you'll see some unusual rep ranges in Antipov's workout chart. "Numbers to me are an estimate," he says. "Set a realistic number, but don't limit yourself. Sometimes I come in and feel like I have plenty of energy, but other times I may feel a little more fatigued from the day before. I like to say I'm going to get at least 10 reps, but if I can go past that I will."

RULE #3: WARM UP, BUT START BIG

After a warm-up set or two of 20-25 reps, Antipov likes to start his workouts with heavy, compound movements that target multiple heads of the shoulder. "I always like to have one exercise where I go really heavy, and that's usually a compound exercise," Antipov says. "After that I start breaking it down into isolation exercises."

RULE #4: BE INSTINCTIVE

It's good to have an overall plan and a general idea of what you are going to train on a particular day. But Antipov likes to train by feel, giving himself the ability to do more or less depending on what his body is telling him. "What exercises I do, the number of sets—that doesn't always mean I'm going to do the same thing," he says. "I put my weak muscle groups first in the week because I know I need to train those more. But your body doesn't know if it's a Wednesday or a Friday. I feel like, if you trained your chest already but it's something you need to work on more, you can afford to train it two to three days later."

RULE #5: GET INTENSE

Drop sets, giant sets, time-under-tension training, negatives—Antipov incorporates these and a number of other intensity techniques into his workouts. For one, he doesn't like to rest very long—30 to 40 seconds, typically. For another, "I like to keep my body guessing," he says, "Keep the tension there and the intensity up. I feel like I need the different techniques in order to get my body to adapt and respond. I wouldn't recommend that to someone from Day 1 if they were just starting working out, though. I've come to this point after years of training."

"It doesn't really matter where you train as long as you have weights—if you have the drive you can really make it work anywhere."



THE V-TAPER WORKOUT

SHOULDERS

EXERCISE	SETS	REPS
Smith Machine Military Press	5	20, 15, 12, 10, 6/Fail/ Fail*
One-Arm Machine Press With Static Hold	4	18, 16, 14, 12
Standing Dumbbell Lateral Raise	4	10/10/10 x 4**
Incline Barbell Front Raise	4	12-15
Reverse Pec Dec Flye	4	14

*Drop set. Reduce the weight by 25 percent and go to failure, then reduce again by 50 percent and go to failure.

**Giant set. With no rest in between sets, perform 10 reps with a light weight, 10 reps with moderate weight, 10 with a heavier weight, 10 with moderate weight, then 10 with a light weight.

ABS

EXERCISE	SETS	REPS
Wheel Rollout	4	12
Superset with		
Side Cable Crunch	4	15
Crunch	4	12-20



STANDING LATERAL RAISE

"I grab heavy, medium and light weight. Starting with light, I do 10 reps (slow and controlled, not lowering all the way down so tension stays on the delts), then immediately 10 reps with medium weight (still focusing on form, but lowering all the way down for a good stretch), then right into 10 heavy reps (these I try to keep as controlled as possible, but sometimes if it's too heavy I just swing them, resulting in cheating reps). Then I go back down to 10 again with medium, then back to 10 with light. I'll do four of these giant sets."

REVERSE PEC-DEC FLYE

"Make sure the seat is high enough so you don't bunch up your traps. Lead with your elbows as opposed to the handles and don't fully extend the arm, keep a slight bend in the elbows. Focus on contracting the rear delt. I also like to sit sideways in the machine and do these one arm at a time; I feel like I can put more focus on the rear delt and involve the triceps and traps a lot less."

INCLINE BARBELL FRONT RAISE

"Lying facedown on an incline bench at about a 30-degree angle prevents you from cheating a little bit more. And because your body is supported, you're not going to rock back and forth so there's less chance of cheating. Lower the weight slowly and use the negative to your advantage, control the weight and resist gravity on the way down."



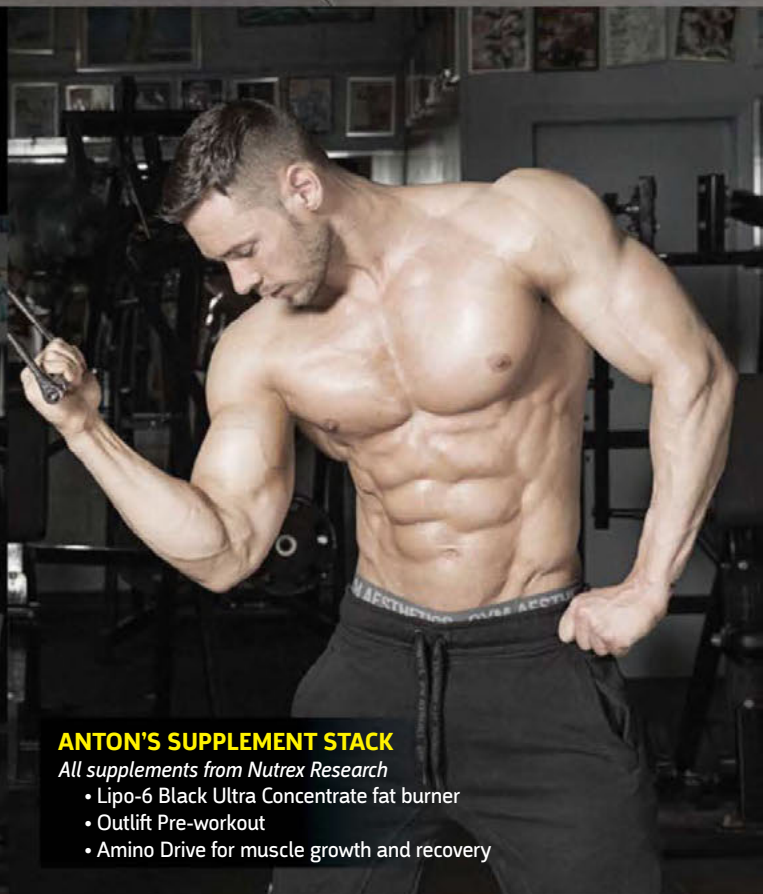
AB WHEEL ROLLOUT

"I usually start leaning into the wheel, so I don't use my body to drag the wheel back, but try to use my core to tuck it under me when I roll back and lean into the wheel. When I roll out I do a pause for about one to two seconds."



SIDE CABLE CRUNCH

"With the cable you just have to be careful not to pull with your biceps— use your elbow and try to bring the handle more forward, slightly across the front of your body to get that extra squeeze. You can also bring your elbow down and bring your left knee up so they meet and really get a good squeeze with the obliques and intercostals."



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"I always like to have one exercise where I go really heavy, and that's usually a compound exercise. After that I start breaking it down into isolation exercises."

CRUNCH

"I use the slow burn technique (see Rule 9) on these. Exhale and MAX contraction are very important factors— make sure you're using your abs and not just pulling on your neck if your hands are behind your head. I like to do these on an ab bench if possible, but if one isn't available then on the floor."

RULE #6: STAY IN CONTROL

Like most personal trainers, Antipov puts a premium on using proper form. But he has another motivation— staying injury free. "I hurt my back on T-bar rows a couple years ago— I was going really heavy, the music was blasting, I had a good pump and I just let my ego take over. What I do now, and what I always teach my clients, is to always hold the contraction for one full second. If there's no pause, you're using momentum to move the weight and you're not fully working the muscle. That's why I do a lot of single-arm movements, to get even more of a contraction."

RULE #7: TRAIN ABS OFTEN

"If you want those 3-D abs, then you need to train them," Antipov says. "Mine recover very quick, so when I'm getting ready for a show or a shoot I train them about five days a week. For most people, I would suggest three to four times a week."

RULE #8: HIT YOUR ABS ON AN EMPTY STOMACH

"One of tricks I've learned, for me, is to train abs in the morning on an empty stomach," Antipov says. "Not because of some fasted theory, but because when I have no food in my stomach I feel I can contract my abs that much better. It's a little harder for me to get that much of a contraction after I've had a couple meals. First thing in the morning, the contraction is insane."

RULE #9: CRUNCH SLOW

"I use a slow burn method I sort of came up with for crunches," Antipov says. "Slowly crunching up, taking three full seconds on the way up, exhaling ALL the air out as you contract and holding the contraction for three seconds. Then doing a slow negative on the way down for another three seconds, pausing only slightly before inhaling and going into the following rep. Exhaling and getting that max contraction are very important factors."

RULE #10: CARDIO WON'T KILL YOUR GAINS

"I used to be very paranoid about losing what got me to where I am, but if you eat enough and sleep enough you're not going to lose any muscle," Antipov says. "I like to do cardio in a fasted state, after my ab routine. I'll do sprints for about 12 minutes to get my heart rate up and then do steady state on the StairMaster for whatever time I have left— usually 20-25 minutes. My whole routine— abs and cardio— usually takes me about an hour in the morning."



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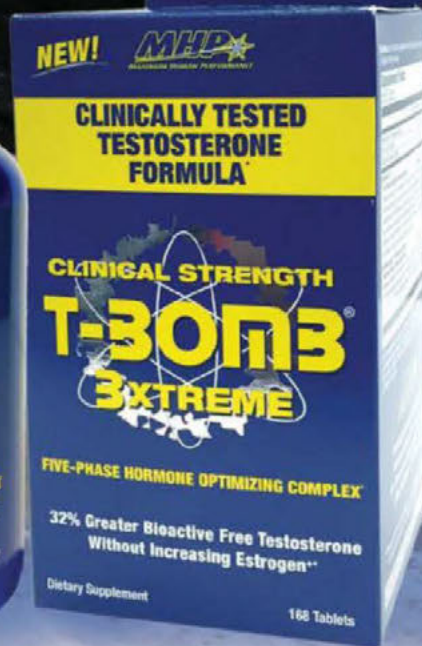
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BETTER — ABS

SEX

EVERYONE ENTERS THE GYM— EXCUSE ME, FITNESS CENTER— WITH UNIQUE GOALS. We all have different motivations that drive us to endure the physical and mental demands of a rigorous workout, face the indignity of struggling in the presence of strangers, and develop sweat stains on clothing that becomes a bit more revealing than intended at the most inopportune moments. After all that discomfort, the reward for many is a “power shake” that has the consistency of gruel, smells faintly of lawn clippings and satisfies hunger no longer than the time it takes to drive by a fast-food restaurant pumping out that french fry smell that turns the most sophisticated ladies and gentlemen into human versions of Pavlov’s dogs.

Why do people return to the gym, day after day? Why do they abstain from the pleasures of pizza and pastries? What possible reward is worth that? Certainly, many do it out of a sense of enjoyment or self-respect; to improve health; increase productivity and safety at work or home; enhance competitive ability in sports or social status; or an obligation to reach a desired level of fitness. Yes, those are valid and socially correct reasons for achieving a physical state that has been recognized as ideal and aesthetic for millennia. However, an underlying goal is embedded into the genetic heritage of our species: gaining sexual favor with a potential mate or mates.

As crude as it may sound in today’s world of global overpopulation and long-delayed frank discussions about abusive behavior toward women by misogynist cultures and individuals (e.g., college campus sexual assaults, sexual torture and slavery by religious extremists, etc.), the pursuit of sexual reward is a powerful motivator down to the most base part of the brain. Need proof? Just look at the role of “sex” in advertising.¹ Thankfully, humans are capable of applying reason when choosing to engage in sexual behavior, and have resources to allow for the enjoyment of recreational sex when properly using methods to reduce the odds of conception (i.e., pregnancy). Cultures that prohibit the use of “birth control” or do not protect a woman’s rights and safety are outside the scope of this discussion.

IN SEARCH OF A SIX-PACK

In regard to physical attraction, potential mates consciously or subconsciously evaluate the fitness, health and sexual potential of their prospective partner. Discounting the equally (or greater) important aspects of attraction that depend upon character, personality, humor, stability, social and psychological compatibility, etc., a person with a lean and athletic core provides a positive stimulus in regard to sexuality. Certain cultures deviate to more “Rubenesque” women (plump in a pleasing or attractive

IN REGARD TO PHYSICAL ATTRACTION, POTENTIAL MATES CONSCIOUSLY OR SUBCONSCIOUSLY EVALUATE THE FITNESS, HEALTH AND SEXUAL POTENTIAL OF THEIR PROSPECTIVE PARTNER.

A SCIENTIFIC APPROACH

BY DANIEL GWARTNEY, M.D.



manner), who are desirable as they are believed to represent greater fertility and capability to deliver healthy newborns. Perhaps more importantly, those who see themselves as highly selective are likely to look for, and pursue as a goal for him/herself, a person with similar features.² In other words, if you are attracted to a physically fit woman, she is likely seeking a physically fit man. With rare exception, “opposites attract” is little more than a myth.

For the man, there is a functional purpose supporting the presentation of a solid, well-developed core in regard to his ability to perform sexually, both for his pleasure and his partner. Certainly, the implication of good health, fitness, ability to adhere to the discipline of exercise and a sound diet, and avoid the metabolic problems associated with abdominal obesity, are fundamentals that tend to give a man with prominent abdominal muscles an advantage over his abdominally flaccid or obese competitor. However, there is also the “eye candy” effect. For sheerly hedonic pleasure-seeking women, nothing grabs the eyes like a set of washboard abs and a nice set of buns. These two features regularly grab the tops spots on body parts women focus on when judging a man’s level of attractiveness.

So, insofar as attracting a partner—for many, the greatest barrier to a fulfilling sex life—it is apparently key to drop the

body fat down to where the abdominal muscles are apparent and the musculature of the buttocks are sculpted. The key steps, of course, are to manage the diet so that body fat is maintained in the upper single digits, and incorporate an exercise routine that creates tone, definition and aesthetic hypertrophy (muscle size) to attract the desired level of attention. Once the “look” has been achieved, is there any further value to having a “six-pack” of abs, strong spinal erectors and the butt of a thoroughbred stallion? Interestingly, form does dictate function to some degree. A solid and sexy core offers the promise of optimal sexual function. Never forget, though, that sexual interaction is only part of a relationship. If you are not capable of developing and maintaining a healthy relationship, you will only be experiencing the transient physical pleasure. Many of the greatest rewards of a sexual relationship are experienced when it supports a thriving relationship; not just satisfying your momentary urges with no regard for your partner. Some of the gravest risks come from indiscriminate promiscuity—or hooking up with pretty much anyone.

50 SHADES OF LUST

The physical act of intercourse was for a time fairly uniform, and globally understood. Most major religions

utilized the physical representation of intercourse to affirm the role between man and woman, with the man in the dominant position. Puritanical influences in British and early American history assigned shame and guilt to LUST—one of the seven deadly sins. Thus the “missionary position” nomenclature, which was referred to by Shakespeare as the “beast with two backs.” This was not always so. The Talmud and many other sources refer to Lilith (apparently the first woman, created alongside Adam) as a sexually voracious woman who would defile men with her sexual dominance. She left, or was cast out of, the Garden of Eden for refusing to “lie beneath Adam,” a reference often interpreted as relating to the “missionary position.”

Author EL James brought sexual

recreation (dance, sports, etc.). Also, there are a number of people who are fixated upon their appearance to the point of having a personality disorder or frank psychosis.³ Yet, compare the psyche of a fit person who is satisfied with his body image to one who is dissatisfied with being obese, or to the psyche of someone who is normal weight but lacking muscular development due to a sedentary job or lifestyle, or even to the psyche of someone who is fit but has a negative self-perception. These negative emotions can be amplified by interaction when seeking approval or acceptance. A negative self-image can also cause insecurities in a relationship, leading to unhealthy distrust, jealousy or a constant need for reinforcement.⁴

So, though it seems superficial,

health are inherited.

The most evident vascular function for men is obtaining and maintaining an erection. Erectile dysfunction has several different causes, but the most prevalent is small-vessel disease (the smaller arteries that supply blood to tissue, including the penis).⁹ Viagra-like drugs work by prolonging the dilation (opening) of those small vessels, supporting the blood flow necessary to “get it up.” A well-developed and ripped midsection and a fit core strongly suggest that the conditions leading to vasculogenic erectile dysfunction are NOT present. Also, as visibly apparent abs are some the “last to appear” and “first to go” muscles, it is a sign that you follow a lifestyle that is not likely to dissipate. For the doubters, a study published in 2012 reported exercise in men under 40 is associated with better erectile function.¹⁰

Beyond that, abs may indicate that you have an endocrine system that is in balance, with a strong testosterone presence. The muscular development notable in the core, and hopefully with full-body symmetry, indicates that testosterone activity is fully expressed. Certainly, erectile function is dependent upon testosterone’s actions (as well as its metabolites). However, this occurs at a concentration that is well below what is necessary for bone and muscle mass maintenance.^{11,12} Showing that you can develop muscle, have a waist circumference that provides a V-taper and are comfortable with your physical image ... the sum total is pretty much a visual guarantee that you are capable of performing sexually.

OK, you attract your partner who anticipates that you have the goods. Mission accomplished? No, of course not—there is still the main event. Sexual intercourse, which of course depends upon desire, comfort, foreplay and a multitude of other underappreciated factors, is a physically strenuous act or series of acts. In fact, sexual intercourse is recognized as an important risk factor for a heart attack.¹³ So, spend a little time on the treadmill, men, if you want to survive heated moments of passion. Sex does burn calories, but the effect is less than other forms of exercise, like riding a bike.¹⁴ So, enjoying sex frequently might have a limited conditioning effect, but it would need to be discussed with your physician first, just like any diet or exercise program.

A SIX-PACK, RIPPED ABS OR V-TAPER—HOWEVER YOU WANT TO REFER TO THE “LOOK”—IS A SIGN THAT ALL SYSTEMS SHOULD BE “GO.”

exploration into the spotlight with the success of the *50 Shades of Grey* trilogy. Again, a story revisited instead of being creative or innovative. Sexual exploration exists in some of the most ancient texts, such as the *Kama Sutra* or the writings of the Marquis de Sade, and it continues in pulp fiction today. Clearly, the need for a strong core is a necessity if exploring some of the more acrobatic positions.

Getting down to the “meat of the matter,” sexual intercourse involves: being able to develop desire and arousal (mental health); intact erectile function (circulatory and endocrine health); physical strength, endurance and flexibility to perform sexually (musculoskeletal and cardiovascular health); ejaculation (sexual function) and post-coital bonding (relationship and social health).

A six-pack, ripped abs or V-taper—however you want to refer to the “look”—is a sign that all systems should be “go.” Let’s call the “look” ripped abs, just for simplicity sake. Though most people of all shapes and sizes are mentally healthy, maintaining a healthy and aesthetic physique is often a reliable sign of a mature and stable personality, as well as a balanced lifestyle in adults. Of course, many young people benefit from their age in being able to develop abs through their youthful metabolism and the physical nature of much of their

being in shape can support a healthy mental state by preventing dissatisfaction relating to a negative self-image, reduce concern about competitive males, express a stable mood and enable a trusting relationship. Abs, in and of themselves, are not a sure thing in regard to mental health. In some cases, it can be an indication of narcissism, obsession, eating disorders, drug abuse or just being a “diva.”^{5,6} However, all else being equal, a nice taper and set of abs can promote mental health and boost confidence in receiving others’ approval and acceptance.

GOOD HEALTH, GREAT ABS AND BETTER SEX

You just can’t develop a great set of abs without being physically active and consuming a nutritious diet (most of the time). Avoiding abdominal obesity greatly reduces the risk of metabolic syndrome, and physical activity helps promote insulin sensitivity.^{7,8} The metabolic syndrome includes hypertension, high cholesterol, abdominal obesity, insulin resistance and other maladies. By avoiding the onset of metabolic syndrome—thought by many to be preceded by insulin resistance and obesity-related inflammation—vascular functions are well maintained. It should be noted that certain conditions affecting vascular

ARE YOU READY TO RUMBLE?

Most sexual positions and motions involve pelvic motion of variable but considerable force and frequency. For the more vigorous, a man may be supporting some or all of his bodyweight; possibly that of his partner as well. Frankly, the frightening possibility of a sex-gym franchise is not outside the realm of marketing creativity. However, it is more important for immediate needs of the partners involved that muscular strength is already present in the abdominal, pelvic and gluteal muscles. Developing the abs for looks will provide the cross-benefit of increasing the strength of these muscles as well. If your partner is attracted to a fit physique, this will provide visual, tactile and functional sensation during an event of heightened desire and arousal. A woman experiences more frequent and intense orgasms if she views her partner as attractive—more so if her friends find her partner attractive.¹⁵ Self-confidence (improved with a positive self-image in the male) and financial wealth also play a factor. Sadly, doing crunches and leg lifts are not a proven road to becoming independently wealthy.

The importance of core strength and integrity in sex can be seen when it is absent (e.g., back injury) or by appreciating the dynamics of the repeated thrusting that characterizes penile-vaginal intercourse, and other variations. Men who suffer from

chronic lower back pain, which can be prevented or reduced with core strengthening, suffer twice as many complaints of sexual dysfunction—including erectile dysfunction, loss of libido and painful intercourse positions.^{16,17} In observance of the risk of back pain, a study compared three sexual positions for spine motion. All three depended upon spinal flexion (abdominal strength), as opposed to extension (lumbar erectors). Quadruped (doggy-style) involved the most rapid movement, with side-lying being the slowest; missionary style was the third position. Interestingly, the most “back-friendly” for the man is doggy-style, with the woman supporting her weight on her elbows.¹⁸ For the woman, the same position but raised to rest her weight on her hands is most comfortable.¹⁹ Again, only three positions were noted, with variations—and the goal was to seek back comfort, not sexual stimulation.

A well-defined core, in a mentally healthy man, is a sign of sexual function and potential prowess when viewed by prospective partners. Great abs demonstrate an adherence to a healthy lifestyle, physical attractiveness, metabolic health, vascular function, hormonal (testosterone) sufficiency, strength and structural integrity—strong indicators that proclaim to an interested party that you are capable of providing a satisfying sexual relationship.

Hard to imagine a more motivating reason to work the core.

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Metab 2015 May 22. [Epub, ahead of print]

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How Physique Olympia Champion Jeremy Buendia Plans to Keep His Title

BY RON HARRIS
PHOTOGRAPHY BY GREGORY JAMES

WHAT IS THE PERFECT PHYSIQUE?

This is a question that has been debated endlessly. For many decades, competitive bodybuilding was the venue to determine the answer. Mr. Olympia champions like Arnold, Frank Zane and Lee Haney represented the ideal male physique as decided by a panel of judges. As the years went by, pro bodybuilders became ever larger and strayed from the older ideals of dramatic V-tapers with broad shoulders and tiny waists, perfect shape, symmetry and proportion. Eventually, a new division was created called Men's Physique (called MPD for short) that embodied all those attributes. It wasn't about the biggest or the freakiest physique—it was about the best physique.

In 2013, Men's Physique was added to the Olympia Weekend. That year, 22-year-old Jeremy Buendia from California was runner-up to the fledgling sport's first world champion, Mark Anthony Wingson. A year later, it was Jeremy whose hand was raised in victory. He was and is the epitome of what MPD stands for. Buendia's physique is athletic and muscular, yet still functional. Powerful delts, pecs, lats and arms are set off by a waspish 27-inch waist with tight abs and chiseled obliques. This is how most men wish they looked, and it's why this new division has skyrocketed in popularity in a remarkably short time.

"It's a more attainable look than bodybuilding," Jeremy explains. "A lot of guys, like myself, were athletes in high school and want to continue competing and challenging themselves. Most aren't interested in trying to become extremely massive. Men's Physique provides an arena for them to challenge themselves, and there's no doubt social media has also given them a platform to share their journeys and be part of something."

STAGE PHOTO BY DAN RAY



BORN TO PUMP IRON

Jeremy's father was an avid bodybuilder, though he never chose to compete. As a fitness instructor at California State University, Chico, training was his vocation. He had his own weights at home, so you could say Buendia has been around them his entire life.

"I used to wake up to the sound of weights clanging on many a morning," he laughs. "He instilled discipline and a love for training in me at a very young age. My dad was my idol, and I wanted to have big muscles just like him."

By age 12, he was lifting, himself, as an adjunct to baseball and football. His older brother had been a Division 1 football prospect at 6'1", but Jeremy knew a possible future in NFL wasn't in the cards once he himself topped out at 5'8". But his competitive drive and spirit never faltered, and just three weeks after graduating high school, Jeremy entered his first bodybuilding contest. He would go on to do nearly 10 of them, winning a couple teenage shows along the way, before discovering the path he was meant to take.

PHYSIQUE: WHERE JEREMY WAS DESTINED TO SHINE

In 2012, Jeremy entered three regional bodybuilding events in California as a 170-pound middleweight, and took second at all three. "I saw that the best middleweights were all two to four inches shorter than me," he says. "For my height, I would have had to put on something like 15-20 more pounds of muscle to be competitive at the national level."

At the same time, Buendia began paying a lot more attention to the new Men's Physique division, realizing he essentially resembled the prototype for what it was looking for. Hearing that the first professional contests for MPD would be held in 2013, culminating at the Olympia in Las Vegas, Jeremy told his trainer at the time that he was going to turn pro and win the Olympia Men's Physique title. "He laughed out loud," Jeremy relates. "Here I was, never

having even entered an amateur show in that division, and I was predicting I would be the best in the world. It sounded crazy. But less than two years later, it had come true."

He was clearly destined for greatness in MPD, as evidenced by the fact that he won four Overall's in a row, with the fourth earning him professional status. And again, the beauty of MPD is that it isn't a "bigger is better" competition. "In fact, I was the lightest man in the top five last year at the Olympia when I won," he explains. "But in terms of aesthetics, symmetry, shape and proportions, I had the best package up there."

HOW HE'LL HOLD ONTO HIS TITLE

It's been two years of Olympia Men's Physique Showdowns, with two champions so far. Jeremy Buendia has no intention of allowing a new man to earn the third annual title. "There are a lot of excellent competitors out there who all want what I have now, and they are all improving," he says. "In the end it comes down to who wants it the most and who will put in the work, and no one is going to out-work me."



JEREMY'S CONTEST DIET*

Meal 1:	1 cup egg whites 3 oz. top sirloin ½ cup oats ¼ cup blueberries 1.5 scoops Cell K.E.M
Meal 2:	6 oz. chicken breast, boneless, skinless 1 cup brown rice
Meal 3:	6 oz. tilapia 6 oz. sweet potato
Pre-workout:	1.5 scoops EVP 1.5 scoops Glycoject
Meal 4 (Post-workout):	6 oz. chicken breast, boneless, skinless ¾ cup white rice 1 scoop Glycoject 1.5 scoops Cell K.E.M.
Meal 5:	6 oz. tilapia 3 oz. sweet potato
Meal 6:	8 oz. top sirloin 7 oz. asparagus <i>All supplements by Evogen Nutrition</i>

JEREMY'S BACK WORKOUT

Wide reverse-grip lat pulldown	4 x 8-15
Seated cable row, underhand grip	4 x 8-15
Dumbbell bent row	4 x 15*
<i>Superset with</i>	
Dumbbell deadlifts	4 x 15
Close reverse-grip lat pulldown	4 x 8-15
Straight-arm pullovers with rope	7 x 15**
Hyperextensions	4 x 25

*Jeremy does not go heavy on these two movements, using no more than a pair of 40- or 50-pound dumbbells. Instead, he performs the reps slowly and with control, focusing on contracting his lower lats and spinal erectors.

**These 7 sets are done in Hany Rambod's FST-7 style, with only 30 seconds rest between. The aim is to finish off the target muscle with an extreme pump.

JEREMY'S CHEST WORKOUT

Incline dumbbell press	
Warm-up:	2 x 12-15
Sets:	4 x 8-15
Cable chest presses	4 x 8-15
Quad set* (done three times)	
Standing cable press	1 x 10
Cable crossover	1 x 10
Standing cable press	1 x 10
Cable crossover	1 x 10
Incline dumbbell flye	3 x 12

Superset with

Incline dumbbell close press**	3 x 12
Smith machine incline press	7 x 10-12

(FST-7 style)

*Jeremy alternates cable presses with cable crossovers/flyes twice for 10 reps, meaning he does 40 reps total. This "quad set" is repeated three times.

**On this variation of incline dumbbell presses, Jeremy keeps the dumbbells together throughout the entire movement to focus on his upper, inner pecs.



"There are a lot of excellent competitors out there who all want what I have now, and they are all improving,"





Key to maintaining his tight waistline has been avoiding certain movements that stress and can thicken the core, such as heavy squats, deadlifts and barbell rows.

Buendia has also taken the past year to add quality mass, per the advice of the judges. “I’m starting my prep about 12 pounds heavier than I did last year, and leaner at this weight, too,” he notes. “My delts were an area I wanted to bring up a bit, and I did that. The added size gives me more of a 3-D look, and I have an even better shoulder-to-waist ratio now.”



Key to maintaining his tight waistline has been avoiding certain movements that stress and can thicken the core, such as heavy squats, deadlifts and barbell rows. “It’s funny, because some of my fellow competitors like to give me crap about that on social media,” he laughs. “That’s fine, let them go ahead and keep doing them. We’ll see who looks better onstage when it’s all said and done, who has kept his waist small and who hasn’t.”

One aspect of being the reigning champion that Jeremy wasn’t quite expecting was the extensive travel schedule representing both himself and his sponsor, Evogen Nutrition.

“I’ve been on the road non-stop,” he states. “This year alone I’ve been to Kuwait, Australia and all over the USA. From February to June, I was only home three weekends.”

Yet through it all, Jeremy steadfastly maintained his clean eating and hard training day after day no matter what. “I’m very focused on my goals, and I have that discipline and work ethic, the mindset of a champion, that my father passed on to me,” he says. “Everybody wants to be a winner. Not everybody is willing to do what it takes to win, and keep winning. The only person who can stop me is me,” he says, “and that’s not going to happen.”

Instagram: [Jeremy_buendia](#)

JEREMY’S TRAINING SPLIT

- Day 1: Chest and abs
- Day 2: Back, rear delts, and abs
- Day 3: Legs
- Day 4: Shoulders
- Day 5: Arms
- Day 6: Rest, repeat

JEREMY’S CONTEST CARDIO ROTATION

- Day 1: StepMill 20 minutes HIIT
- Day 2: StepMill 25 minutes steady state
- Day 3: StepMill 20 minutes HIIT
- Day 4: OFF
- Day 5: StepMill 20 minutes HIIT
- Day 6: StepMill 20 minutes HIIT
- Day 7: Plyometrics, varies

JEREMY BUENDIA STATS

- Birthdate: October 10, 1990
- Height: 5’8”
- Weight: 170 pounds (contest); 187 pounds (off-season)
- Birthplace: San Jose, California
- Current residence: Roseville, California
- Strongest lift: Bench press of 425 at 175 pounds
- Favorite quote: “If success becomes your only option, failure becomes irrelevant.”

TOP TITLES:

- | | |
|---|---------------------|
| 2013 NPC Junior USA | Class B and Overall |
| 2013 IFBB Greater Gulf States | Winner |
| 2013 IFBB Sacramento Pro | Winner |
| 2013 IFBB Olympia Men’s Physique Showdown | Second place |
| 2014 IFBB San Jose Pro | Winner |
| 2014 IFBB Olympia Men’s Physique Showdown | Winner |

STAGE PHOTO BY DAN RAY



IT'S ABOUT PERFECT TRAINING, NOT HOW MUCH YOU LIFT!

Jeremy trains damn hard, as should be obvious with one look at him, but he doesn't worry about training super heavy as he once did. "Now it's much more about using perfect form, really engaging the target muscle and getting the absolute best mind-muscle connection I can," he explains. "The goal any time I train is to get the best pump possible in that muscle group, and you're never going to do that just slinging heavy weights around."

He also keeps his rest periods between sets fairly short, and is a big fan of supersets and "quad sets," doing four sets back to back. Jeremy also employs "Sevens," a technique made famous by his coach Hany Rambod, in which seven sets of an exercise are done in rapid succession, resting just 30 seconds between. "The pump is critical to muscle growth, even more so than simply lifting heavy resistance."



"THE PERFECT PHYSIQUE" —The Film

Just before Jeremy heads to Las Vegas to defend his title, a film titled "The Perfect Physique" will premiere at the Toronto Film Festival. This documentary directed by Kandice King offers a glimpse into the world of top physique competitors and models and also stars Sadik Hadzovic, Jason Poston, Matt Christianer and the late Greg Plitt.

"I spent a week shooting it, and learned so much from the other guys," he tells us. "It was an amazing opportunity to learn from some veterans how to make the most of your career in the industry, and the many avenues available on the business end." He wasn't allowed to speak in detail about the film until after its release, but is excited to see how it's received and how it will raise awareness and interest in Men's Physique.

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Ideal Rep
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A BETTER WAY TO DO BURPEES

PLUS FAT-BURNING, BODYWEIGHT INTERVAL WORKOUT

Most trainers and fitness enthusiasts— of all varieties, not just CrossFit athletes— perform the burpee exercise with less-than-optimal form. What do I mean by this? By going down with their feet together and back bent over, they make the movement both less safe and less metabolically demanding than it could be.

So what's the solution? Perform your burpees less like a squat and more like a sumo deadlift. This moves the stress from the back to the hips and legs, which also enables you to work harder.

HERE'S HOW TO PERFORM THE BURPEE 2.0:

Set up: With your feet slightly wider than shoulder-width apart, hold your arms straight in front of your body so they're hanging between your feet.

Action: With your knees slightly bent and your hips forward, place your hands on the ground with your wrists directly underneath your shoulder and jump your legs backward so you end up in a push-up position. Jump your feet up to the outside of your hands and return to the tall standing position to complete the rep.

COACHING TIPS:

- Make sure that your body forms one straight line and that you do not allow your hips to sag toward the floor each time you're in the push-up position.



- Each time you jump your feet up to the outside of your hands, be sure to drop your hips down into a squat-type position before you stand up tall.

Of course, you can add a push-up at the bottom of each burpee, if you'd like. You can also add a jump at the top of each burpee if you're looking to make this exercise more dynamic, and want to further increase the metabolic demands.

Now that you understand a better way to perform the burpee, we can talk about how to use this exercise as a part of a great Tabata-inspired metabolic bodyweight sequence. But first, we must clear up some confusion about Tabata training.

THE TRUTH ABOUT TABATA WORKOUTS

A Tabata interval is a high-intensity interval training protocol originally created by Japanese researcher Dr. Izumi Tabata. Each Tabata interval consists of 20 seconds of high-intensity (as hard as you can go) exercise followed by 10 seconds of rest. This is repeated for eight rounds, totaling four minutes time.

Contrary to popular belief, the original Tabata interval training study does not measure fat loss. There was no mention of fat loss in the paper at all.¹ Secondly, in the study, Tabatas were done on a bike and performed at 170 percent of VO₂ max. If you don't know, VO₂ max is defined as the highest rate of oxygen consumption attainable during maximal or exhaustive exercise. As exercise intensity increases, so does oxygen consumption. That said, a point is reached where exercise intensity can continue to increase *without* an associated rise in oxygen consumption.

With this reality in mind, even if Tabatas are effective for fat loss and conditioning, which other scientific evidence on interval training tells us that they probably are due to their high-intensity nature,^{2,3,4} using resistance training or bodyweight training modalities to perform them likely won't enable you to reach 170 percent of VO₂ max on every set, if at all. So, sequences that use resistance training or bodyweight training, like the one provided in this article, are "technically" not a true Tabata. Instead, they are "Tabata-inspired" because they use the same interval framework of 20 seconds of high-intensity (as hard as you can go) exercise followed by 10 seconds of rest, repeated for eight rounds, totaling four minutes time.

Also, traditional Tabatas consist of one exercise: the bike. However, when performing a Tabata-inspired circuit using resistance training or bodyweight training, there are three reasons why better options allow you to rotate between multiple exercises:

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CARDIO BURN

1. When you only use one exercise such as squats for the entire Tabata, the legs gradually fatigue with each working set. This centralized leg fatigue reduces the overall intensity of the Tabata.

2. Using more than one exercise prevents centralized muscle fatigue and helps you maintain the same high level of intensity in each round.

3. Mixing in more than one exercise boosts the overall metabolic demand because it involves more muscles. Put simply, more muscles worked means greater energy demand, which in turn means faster fat loss.

Plus, doing the same exercise eight times for four minutes straight is just plain boring. The workout is already challenging, why make it monotonous, too?

TABATA-INSPIRED BODYWEIGHT CIRCUIT

The following circuit uses four different exercises performed two times each.

- 20 seconds Speed Squat (perform the reps as fast as possible)
- 10 seconds rest
- 20 seconds Burpees
- 10 seconds rest
- 20 seconds Mountain Climber (keep neutral spine)
- 10 seconds rest
- 20 seconds Speed Skips (in place) (lift knee above hip)
- 10 seconds rest
- 20 seconds Speed Squat (perform the reps as fast as possible)
- 10 seconds rest
- 20 seconds Burpees
- 10 seconds rest
- 20 seconds Mountain Climber (keep neutral spine)
- 10 seconds rest
- 20 seconds Speed Skips (in place) (lift knee above hip)

You can use this Tabata-inspired circuit up to three times per week as a “finisher” after strength training.

Nick Tumminello is the owner of Performance University in Fort Lauderdale, Florida. He's also the author of the book *Strength Training for Fat Loss* and the DVD by the same name. For more information visit www.NickTumminello.com.

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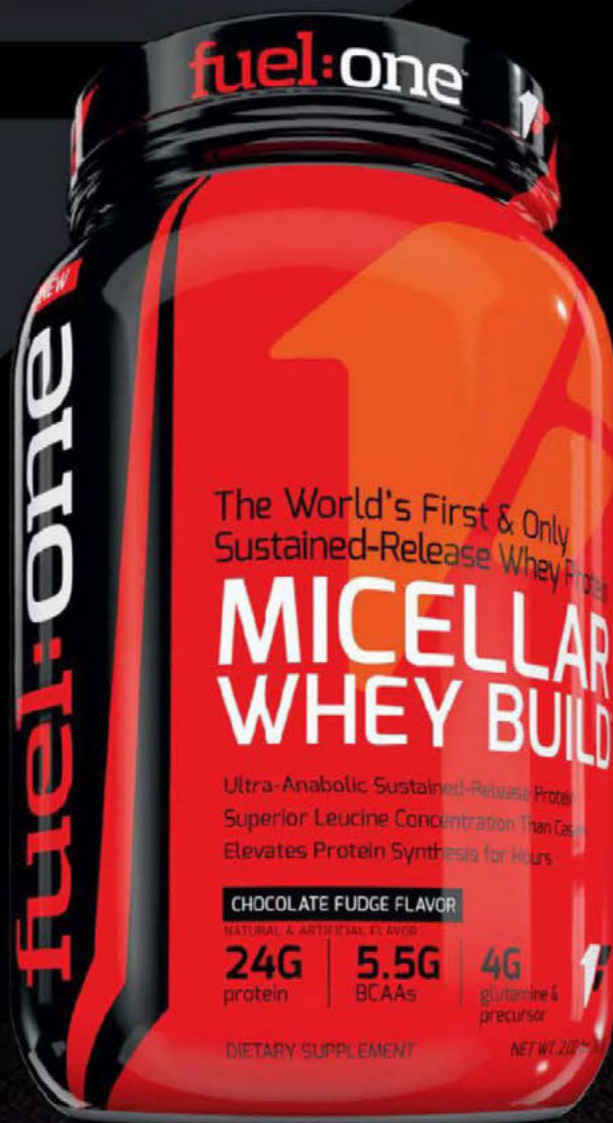
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BUILD **RAZOR-SHARP** ABS

WITH INCLINE BOARD SIT-UPS

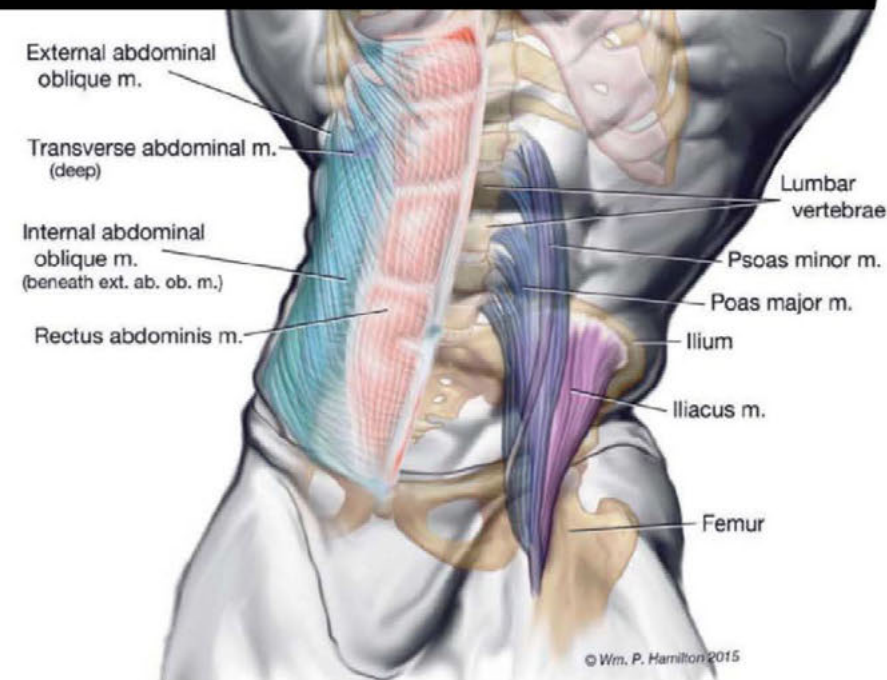
It's easy to let abdominal training slide in favor of mass-building exercises. But let's face it—smooth, razor-sharp abs are essential for a fit physique. Even if you can deadlift a lot of weight, this is not going to make ripped abs pop out from above your belt—you will need an exercise that tightens (but does not overstretch) the entire abdominal wall.

MUSCLES INVOLVED

The rectus abdominis is the primary vertical muscle of the anterior abdominal wall.¹ The two halves of the rectus abdominis begin on the center of the pelvic bones of the hip girdle, and insert into the xiphoid process at the base of the sternum and a few rib cartilages near the sternum. The short fibers of the rectus abdominis run between tendinous intersections that create the grooves (“six-pack”) when they are tensed. When both right and left halves of this muscle contract, the trunk is flexed forward so that the head and chest move closer to the hips and legs during sit-ups.²

The external oblique is a large, flat abdominal muscle that begins along the lower half of the ribs.¹ Its fibers run from lateral to medial, to attach on the pubic and iliac bones of the pelvis. When both sides of the external oblique muscles contract, they flex the trunk so the head will move toward the feet. If only one side contracts, the trunk will flex (twist) toward the opposite side.¹

The internal oblique muscle is deep to the external oblique muscle. It begins on a thick, connective tissue called the thoracolumbar fascia, and also from the iliac bone of the hip.¹ Its fibers run toward the head, at right angles to the external oblique muscle, and attach on the lowest three or four ribs.¹ Similar to the external oblique muscle, the internal oblique will flex the trunk at the waist and move the head toward the feet, if both the left and



right portions of the internal oblique contract together, as is the case with sit-ups.³ The internal oblique twists the body toward the right if only the right side contracts.¹

The transversus abdominis is the deepest anterior abdominal muscle.¹ The fibers of this muscle run parallel from the rib cartilages, the vertebral column and the iliac crest of the hip to the sheath of the rectus abdominis. This muscle helps to pull the abdominal wall in during a “vacuum,” when trying to suck in the abdomen.

The psoas major and iliacus muscles function as a single muscle (hence the name “iliopsoas” muscle). The iliopsoas is one of the strongest hip flexors, and is very active when sitting up from a supine position.⁴ The psoas major is located beside the thoracic and lumbar vertebral column, while the iliacus muscle sits over the iliac bones of the hip. The fibers of the iliopsoas attach via a tendon to the femur bone of the thigh.

INCLINE BOARD SIT-UPS

1. Position your feet under the pads of an incline board. Bend your knees to reduce the work of the iliopsoas muscle and increase the work for the abdominal muscles.⁴

2. Lie down so that your middle and lower back make contact with the slant board. Place your hands on your hips. You can also fold your arms across your chest.

3. Curl your shoulders and head forward toward your chest, and tense your abdomen as you begin the upward movement. This will guarantee that you are activating the upper rows of the rectus abdominis.⁵

4. Continue to sit upward, and do not forget to curl your shoulders forward. Raise your upper body as high as you can.

5. From the top position, reverse the movement and control the descent of your body. Do not un-curl your shoulders until you hit the starting position² and then immediately go into the next repetition, starting with curling your chin and shoulders toward your chest.



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If you fail to curl your shoulders forward, or if you curl with your feet anchored while your knees are too straight, most of the upward force will come primarily from the iliopsoas muscle and thigh musculature⁶ instead of the anterior abdominal wall.³ Thus, do not tense your thighs, and try to avoid strongly tensing your hip flexors to complete each repetition (do not try to pull with your thighs or legs).³

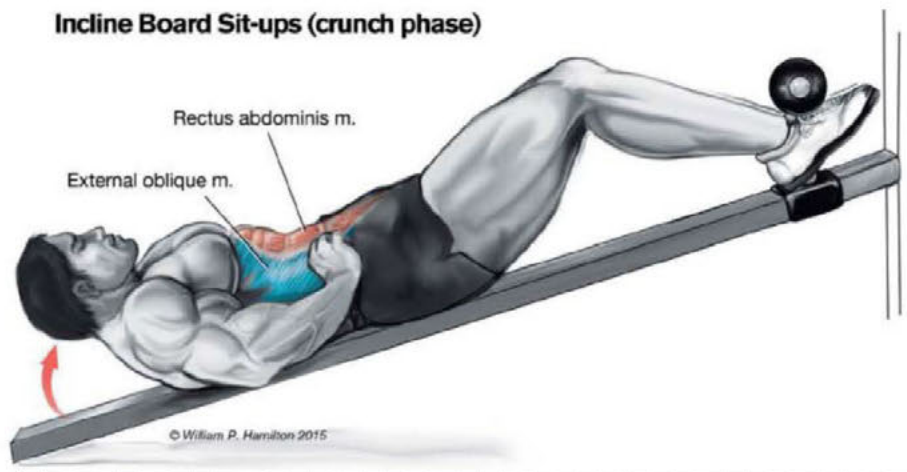
It is a good idea to eliminate holding your breath during any sit-up⁷, since this increases the intra-abdominal pressure and prevents the abdominal fibers from shortening as much (although it might feel easier to do a sit-up while holding your breath). If anything, it is good to either exhale as you are doing the sit-up or even better, exhale before the contraction—and then concentrate on achieving a maximal shortening of the fibers during the exercise. Either of these approaches will strongly activate the fibers of the transversus abdominis, and ensure that the fibers of the anterior abdominal wall are not stretched during the exercise.

Of course, you cannot expect that the negative effects of five daily trips to McDonald's can be offset by a single exercise. However, with a careful diet and some aerobics to accelerate fat loss, adding four sets of 14-20 repetitions of sit-ups on the incline board can be an important key to building razor-sharp abs. ■

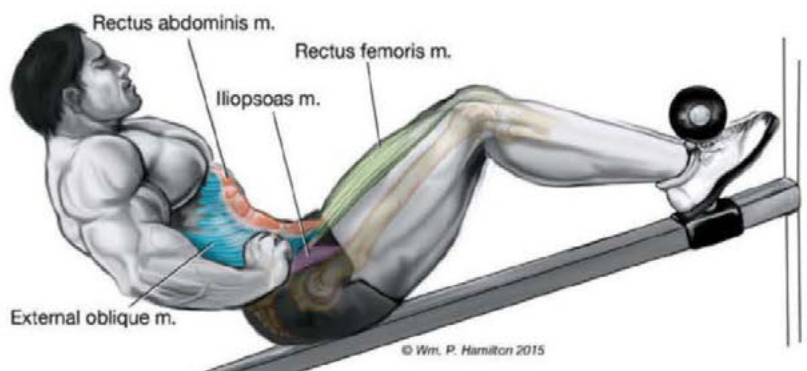
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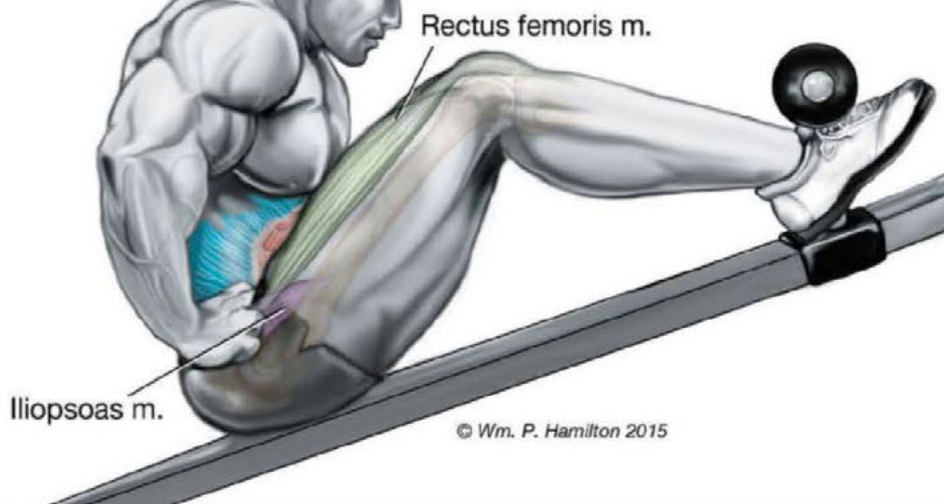
Incline Board Sit-ups (crunch phase)



Incline Board Sit-ups (mid position, hip flexors contracting)



Incline Board Sit-ups (finish, hip flexors complete the movement)



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WHAT IS THE IDEAL REP RANGE FOR BUILDING MUSCLE?

One of the age-old fitness questions is whether a powerlifting-type routine can build as much muscle as a bodybuilding-type routine. On the surface, it would seem that the bodybuilding routine has a clear advantage in this regard. After all, it's no secret that bodybuilders are generally bigger than powerlifters. If low reps and long rest intervals were the key to increasing muscle, then every bodybuilder would be training like a powerlifter, right?

While this premise might seem logical, science tells us that logic doesn't always translate into practice. In order to accurately assess which type of training packs on the most lean mass, it's necessary to carry out controlled research where variables are strictly controlled. Only then can you draw a true cause-effect relationship on results.

THE RESEARCH

Several previous studies have investigated this topic in a controlled fashion. Some did indeed show better results with bodybuilding-type training compared to powerlifting-type training^{3,8}, while others found no differences between the two.^{1,2} A big limitation of these studies is that they were all carried out using untrained subjects. It's common knowledge that newbies respond to virtually any training stimulus; heck, even cardio produces hypertrophy in those who are sedentary! Consistent training causes alterations in anabolic intracellular signaling⁴ along with altered acute protein synthetic^{9,12,14} and transcriptional responses⁵ that indicate a blunting of hypertrophic adaptations. Thus, you can't necessarily extrapolate results from the aforementioned research to experienced trainees.

A recent study from my lab¹¹ sought to provide clarity on the topic in well-trained men (4+ years average lifting experience). Subjects were randomly assigned to perform

either 1) a powerlifting-type routine using low reps (2-4 per set) and long rest intervals (three minutes between sets), or 2) a typical bodybuilding-style workout with moderate reps (8-12 per set) and shorter rest intervals (90 seconds between sets). Total volume-load (reps x sets x load) was equated between groups to ensure that any differences would not be confounded by the amount of work performed. Thus, the powerlifting group performed seven sets per exercise while the bodybuilding group performed three sets. All sets were performed to the point of momentary concentric muscular failure. Training was carried out three times a week for eight weeks.

The results might surprise you. While both groups significantly increased muscle mass, there were no differences noted between groups. In other words, both groups gained approximately the same amount of muscle over the course of the study, regardless of rep range! Interestingly, while both groups significantly increased their one-repetition maximum (1RM) in the squat and bench press, there was a slight edge to the powerlifting group in terms of strength gains.

On the surface, these findings might lead you to conclude that, from a hypertrophy standpoint, it doesn't matter whether you train like a powerlifter or bodybuilder. After all, the study provides compelling evidence that as long as sufficient volume is performed, you'll achieve similar increases in mus-

cle, regardless of rep range. And given that strength was greater in the powerlifting group, a case can be made that it's best to train like a powerlifter and get the best of both worlds, right?

Well, not so fast.

Here's the rub: Total training time in the powerlifting group was about 70 minutes, while that of the bodybuilding group was just 17 minutes. So from a time-efficiency standpoint, bodybuilding-type training produced similar hypertrophy (as well as nearly similar strength increases) in about a quarter of the time as the powerlifting routine.

What's more, exit interviews with participants in the powerlifting group indicated that they were fried by the end of the eight-week study. Virtually all said they had sore joints and complained of being mentally fatigued from the constant grind of performing heavy, low-rep sets; two of the subjects in the group dropped out from overuse injuries. Had the study gone on any longer, I'm certain these lifters would have become overtrained and ultimately seen a regression in results. On the other hand, those in the bodybuilding group reported feeling fresh. They were eager to get back in the gym, with many expressing a desire to increase training volume and frequency.

HIGH VOLUME ISN'T PRACTICAL

So here's the take-away message: While it appears that muscle growth can be similar with both heavy and moderately-heavy loads, provided that volume is equated, it just isn't practical to constantly train with high volumes and heavy loads over time. Understand that there is a clear dose-response relationship between volume and hypertrophy whereby

higher training volumes correlate with greater muscle growth, at least up to a certain point.^{7,10,13} Because of the long rest periods and additional sets needed to equate volume in the powerlifting group, our study was only able to include three total exercises per session for a limited number of muscle groups (back, chest and thighs). That's simply not sufficient to maximize whole-body hypertrophy.

Achieving complete muscular development and symmetry requires working all the major muscle groups from different angles and planes of movement. A true hypertrophy routine needs to focus on specific muscles (and aspects of muscles) such as the middle and posterior delts, the hamstrings and the calves.⁶ The large time commitment associated with powerlifting-type training makes it virtually impossible to accomplish this goal in the context of a well-rounded routine. And even if you are one of the lucky guys who have all day to do nothing but work out, training exclusively with low reps still isn't a feasible strategy for maximizing hypertrophy. All that grinding on the joints and overtaxation of the neuromuscular system would ultimately wear you down. You'd rapidly end up overtrained, with nagging injuries and diminished performance. Not a good recipe for continued gains.

THE BOTTOM LINE

All things considered, the best approach to maximizing muscle mass is to train with a combination of low and moderate reps. The typical "bodybuilding rep range" should form the basis of a hypertrophy-oriented routine as it allows the performance of a greater amount of volume without overtaxing the neuromuscular system. That said,



"THE BEST APPROACH TO MAXIMIZING MUSCLE MASS IS TO TRAIN WITH A COMBINATION OF LOW AND MODERATE REPS."

don't hold exclusively to such training. Adding in some heavy-load sets in the 1-5 RM range helps to maximize strength, which ultimately allows the use of heavier loads during moderate-rep lifting. And lifting heavier without compromising the number of reps increases mechanical tension in muscles—a primary driving force for lean muscle growth. ■

Brad Schoenfeld, Ph.D., CSCS, FNSCA is widely regarded as one of the leading authorities on training for muscle development and fat loss. He has published over 60 peer-reviewed studies on various exercise- and nutrition-related topics. He is also the author of the best-selling book, *The M.A.X. Muscle Plan*, and runs a popular website and blog at www.lookgreatnaked.com.

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STRONG TO THE CORE

FORTIFY YOUR ABS AND BACK WITH PIKES ON A BALL

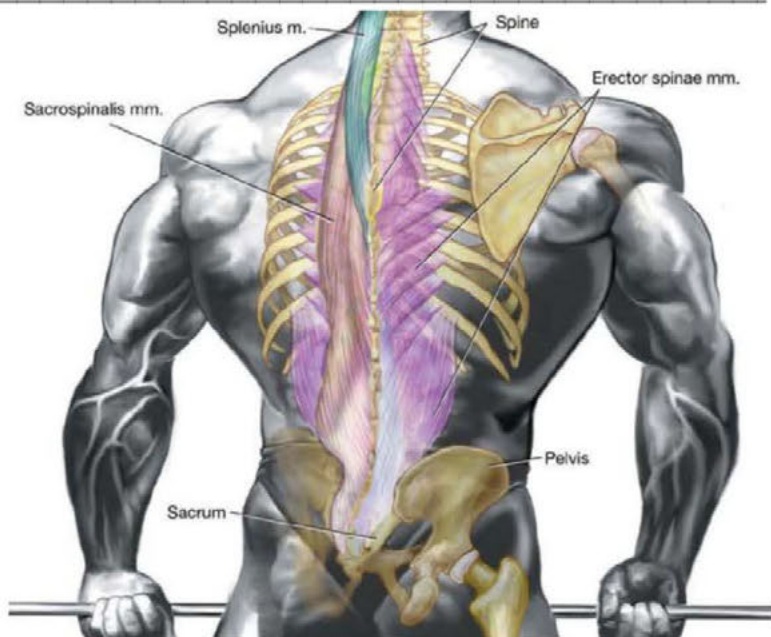
The entire core is a collection of muscles that create a critically important frame from which all of your body movements take anchor. As a result, developing a strong core is an important step that is needed by every trainer who seeks to realize the potentials to experience huge gains in strength and power, or acquiring the proficiency in most skilled athletic challenges. Although there are many good exercises that fit this need, pikes on a stability/Swiss ball are among the leaders in activating and coordinating a host of core muscles^{1,2} while also strengthening, providing improved control and balance into this network we describe as the “core.”

MUSCLES USED

The core is most frequently thought of as including the abdomen and lower back, but a lot of muscles are part of the core network. In fact, superficial and deep abdominal muscles along with the erector spinae and middle and deep back muscles can be considered part of the body's core. Pike on a ball represent a challenging core exercise that includes activation of the anterior, middle and deep abdominal muscles, spinal erector, shoulders and triceps muscles.

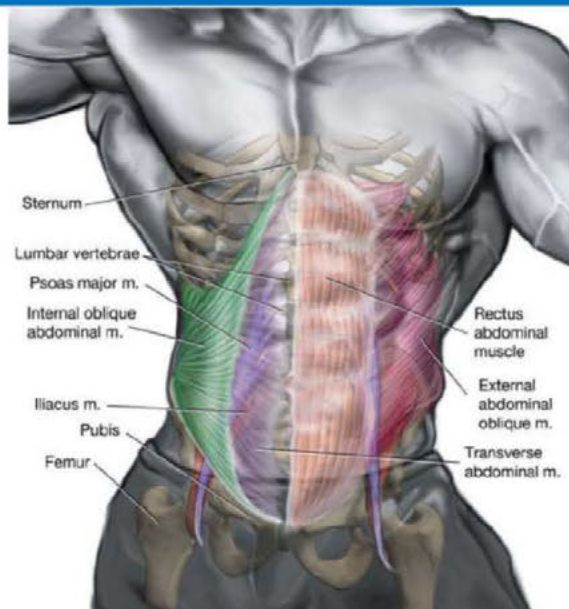
The muscles of the abdominal wall are strongly activated by pikes.^{1,2} The superficial rectus abdominis provides the six-pack look when your body fat is low. When both halves of the rectus abdominis contract, the head and trunk are moved toward your hips,^{3,4} as is the case in the pike movement. The laterally positioned fibers of the external oblique muscle are angled in the same direction that your fingers would point if you were to put your hands in your pockets.³ The deeper internal oblique muscle connects to the iliac bone of the hip and its fibers run around the side of the trunk at right angles to the external oblique muscle and attach to the lowest three or four ribs.³ Both the external oblique muscle and the internal oblique muscles flex the trunk at the waist and move the head toward the feet during the pike movement. The transversus abdominis muscle is the deepest of the anterior abdominal muscles. It begins on the lower five and six costal cartilages of the ribs and they terminate in the rectus sheath that surrounds the rectus abdominis muscle.³ This muscle contracts to compress the ribs and the abdominal cavity (sucking in the stomach), thereby providing core stability through the ribs, spine to the hips.

The iliopsoas muscle is a deep hip flexor that is made up of the psoas major and iliacs muscle.³ The



fibers of this muscle attach to the lumbar vertebrae and along the iliac fossa on the inside of the hip girdle. They attach by a tendon to the inside of the femur bone near the hip joint. The iliopsoas helps to flex the thighs and brings the feet closer to the torso in the pike exercise.^{3,5}

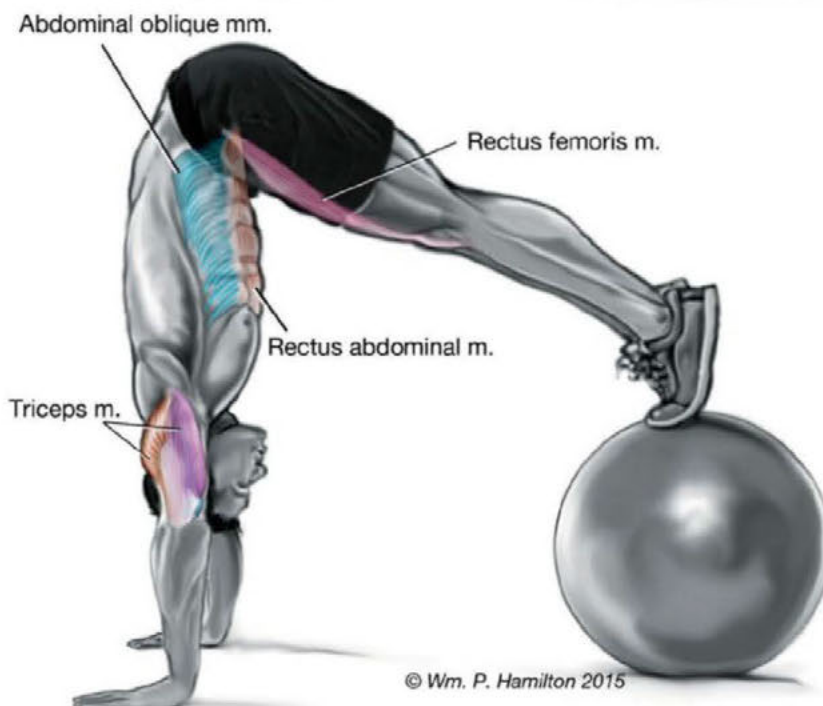
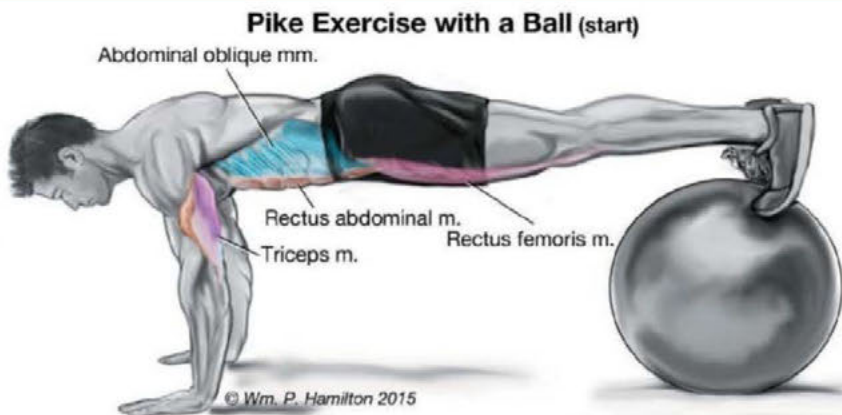
Several postural spine muscles, which together are called the erector spinae,³ are strongly activated in the pike movement on a ball.^{6,7} From lateral to medial, the iliocostalis, longissimus and spinalis muscles run from the iliac crest of the hip-bone, to the ribs and from vertebrae to vertebrae to create a strong spinal column of muscle fibers.³ The multifidus is deep to the longissimus and generally spans three vertebrae segments with fibers that run from lateral to medial. The erector spinae muscles extend the spine and the multifidus helps to stabilize the spinal units during movement.³



The three-headed triceps brachii muscle is contracted throughout the pike to support the upper body by extending the elbow joint. The triceps fibers begin on the scapula (shoulder blade) just inferior to (below) the head of the humerus bone at the shoulder joint and along the posterior side of the humerus bone of the arm.³ The fibers join the triceps tendon that crosses the elbow joint posteriorly and attaches on the ulna bone near the elbow.³ Space limitations do not allow us to describe other muscles (e.g., deltoids, pectoralis, middle back muscles, trapezius, etc.) that are activated by pikes.

EXERCISE: PIKES

1. Place a Swiss (stability) ball on the floor and give yourself enough room so that you won't run into anything during the exercise.
2. Lie on your stomach (prone) in front of the ball. Lift your feet and place them on the ball.
3. Position your hands on the floor beneath your shoulders and extend your elbows as if you have completed a push-up. Start with your body in a straight line (hips and knees straight).
4. Flex your hips but keep your knees straight so that the ball rolls toward your head. Control the ball movement and keep the toes in contact with the ball.
5. Your buttocks will move up toward the ceiling as you flex your hips to take on the pike or jackknife position. Your triceps and shoulders will assume more of your bodyweight as you move the ball forward. Keep under control at all times to avoid losing your balance.
6. Slowly reverse the movement so that your body is straightened to the starting position, then repeat the movement. Keep the elbows extended throughout the exercise and do not rest your chest on the floor until you have completed the set.
7. Inhale as you are stretching out, and exhale as you are moving into the pike position. You should work up to three sets of 20 repetitions.



If you become serious about your abdominal training as part of your core emphasis, you must elevate your metabolic rate to help consume the adipose (fat) tissue that has taken up residence on your waist. It also helps to add exercises like the pike that include a complex group of muscles and not just work the muscles in isolation. Reinforcing your core is important because it can be like laying one steel beam next to another—with enough building, you have a structure that is able to improve your endurance, strength and balance, and provide the pillars of power that will protect you from injury and propel you to greater physical heights. ■

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CAPSAICIN:

BOOSTS METABOLIC RATE AND TESTOSTERONE WHILE DIETING

Many people can lose weight for a few months, but many struggle to maintain that weight loss over longer periods of time. One explanation for the inability of long-term weight loss is that dieting initiates homeostatic mechanisms that reduce energy expenditure within the body, ultimately promoting a positive energy balance that results in a return to previous weight levels. Of course, reduced energy expenditure from low caloric intake also makes it difficult for anyone trying to exclusively gain lean muscle mass, as depleted energy expenditure also inhibits fat loss. Consequently, the capacity to blunt this diet-induced reduction in energy use should enhance the ability to decrease body fat and keep it off, too.

THERMOGENICALLY INCREASE ENERGY EXPENDITURE

Attempts to advance weight loss, and weight-loss maintenance, by increasing energy expenditure have recently embraced the use of several naturally occurring compounds, including capsaicin, which is the agent in chili peppers that provides the hot and spicy flavor. Capsaicin has been shown to potently increase energy expenditure by stimulating a process known as thermogenesis.¹ Although the mechanism of action is not completely understood, some of the details include capsaicin activation of the TRPV1 receptor found within the oral cavity, and gastrointestinal tract, which triggers the release of noradrenaline. The release of noradrenaline then increases energy expenditure and fatty acid oxidation within brown adipose tissue (BAT) by stimulating thermogenesis, which uncouples the normally linked process of fatty acid oxidation with cellular energy production in the form of ATP. As a result, instead of the energy from fat being used to synthesize ATP, which requires active processes like muscular contraction to increase energy expenditure, energy is instead directly converted into heat, increasing energy expenditure.

The ability of capsaicin to curtail the decreased energy expenditure caused by dieting should improve the ability to shed, and maintain the loss of, unwanted body fat for considerable periods of time. Furthermore, thermogenically induced energy expenditure is not inhibited by caloric restriction like many other energy-consuming processes that are turned down by the



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previously mentioned homeostatic mechanisms. This, of course, means that no matter how hard you diet, capsaicin will still boost energy expenditure. In fact, the more severe the diet, the more likely you are to benefit from capsaicin—as greater levels of caloric restriction more potently diminish metabolic rate, giving capsaicin a greater opportunity to supplement this deficiency in energy expenditure.

REIGNITE A SLUGGISH METABOLISM

In order to see if capsaicin could, in fact, diminish the reduced energy expenditure brought on by dieting, a recent study by Janssens et al.² looked at the influence that capsaicin had on energy expenditure levels in test subjects who consumed 75 percent of their normal caloric intake, with or without capsaicin. The results of the study showed that the group taking capsaicin had an effective negative energy balance of 20.5 percent, meaning they had a reduction in energy expenditure of 4.5 percent, while the group that did not consume capsaicin showed an effective negative energy balance of 19.2 percent, or a reduced energy expenditure of 5.8 percent. So, the group consuming capsaicin had a 1.3 percent higher energy expenditure relative to the control group, clearly demonstrating that capsaicin increased energy expenditure while dieting. In addition, the group taking capsaicin also showed a significant increase in fat oxidation, while there was no significant increase in fat oxidation in the control group. The increased fat burning induced by capsaicin will likely enhance body composition by promoting a reduction in fat mass.

This study by Janssens et al. also demonstrated that the effects of capsaicin on energy expenditure and fatty acid oxidation require several days of capsaicin intake, at a dosage of 2.6 milligrams per day. This study clearly showed that energy expenditure and fatty acid oxidation did not increase in the first day, but did increase after a few days of capsaicin intake—and that consuming an amount of capsaicin lower than 2.6 milligrams per day had no influence on energy expenditure or fat burning.

ELEVATE TESTOSTERONE WHILE DIETING

In addition to caloric restriction promoting a sluggish metabolic rate, caloric restriction also has the capacity to reduce testosterone production³, which likely contributes to the unwanted loss of lean muscle mass typically seen while dieting. The reason for this effect has to do, in part, with the low energy levels that come with caloric restriction, which slows down many biochemical processes that are not absolutely essential for survival. Regrettably, one of the non-essential processes turned down while dieting is the production of testosterone, meaning testosterone levels typically decline after extensive caloric restriction.

Fortunately, there may be a solution to this dieting dilemma, as it has recently been shown that capsaicin can reverse the negative impact that hypocaloric diets have on testosterone

production. According to a study by Lilhan et al.⁴, capsaicin accomplishes this by reducing production of the peptide hormone ghrelin, which is normally secreted by an empty stomach to tell the brain to increase hunger and promote food intake. It turns out that ghrelin also inhibits the production of testosterone, meaning that low-caloric diets—that naturally increase production of ghrelin, because the stomach is more likely to be empty—also decrease testosterone production. In fact, this study clearly shows that a dose of capsaicin lowered ghrelin levels in the testosterone-producing cells within the testes of rats, resulting in a large increase in testosterone.

This study also showed, somewhat surprisingly, that capsaicin actually increased serum levels of ghrelin throughout the rest of the body, which would suggest that capsaicin intake would decrease testosterone production—which, as previously mentioned, did not happen in this study. So, in rats, it appears that ghrelin influences testosterone production through an unknown

mechanism that may involve the direct regulation of the testosterone-producing cells within the testes. On the other hand, in humans, it seems as if capsaicin has a more systemic effect, as capsaicin intake has been shown to decrease serum ghrelin levels⁵ and increase testosterone levels.⁶

In closing, the unique ability of capsaicin to increase energy expenditure and boost testosterone levels while consuming a low-calorie diet makes capsaicin a perfect choice when one is trying to shed as much body fat as possible without losing any lean muscle mass. Capsaicin also represents a very effective way to lose weight and keep it off, as many dieters today typically

yo-yo back to their original weight, in large part because their metabolic rate becomes so sluggish, which promotes a positive energy balance that brings back those unwanted pounds that were so hard to lose in the first place. ■

For most of Michael Rudolph's career he has been engrossed in the exercise world as either an athlete (he played college football at Hofstra University), personal trainer or as a research scientist (he earned a B.Sc. in Exercise Science at Hofstra University and a Ph.D. in Biochemistry and Molecular Biology from Stony Brook University). After earning his Ph.D., Michael investigated the molecular biology of exercise as a fellow at Harvard Medical School and Columbia University for over eight years. That research contributed seminally to understanding the function of the incredibly important cellular energy sensor AMPK—leading to numerous publications in peer-reviewed journals including the journal *Nature*. Michael is currently a scientist working at the New York Structural Biology Center doing contract work for the Department of Defense on a project involving national security.

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THE 2015 USDA REPORT ON DIETARY GUIDELINES

OUR GOVERNMENT IS TELLING US WHAT TO EAT—SHOULD WE LISTEN?

In the “dietary fat is evil” 1990s, we were practically spoon fed low-fat and fat-free foods by the truckload. Americans took the advice to heart and dutifully cut down on eggs, shrimp, full-fat dairy and other higher fat foods while turning to fat-free cookies, bagels and fat-free butter-like spread. Despite following this advice, our nation kept getting fatter. And then a plethora of movies hit the theaters to show us how our food is produced and why we are fat. When food companies started taking the fat out, they often replaced it with sugar while total calories stayed the same or increased.

As journalists started digging through dietary research and interviewing experts, a story started to unfold about politics, food lobbying and dietary recommendations; the three are so intertwined some have suggested our government couldn't possibly make non-biased recommendations about nutrition and health. If you too are tired of conflicting nutrition advice and not sure who to believe, it's time to take an in-depth look at the Dietary Guidelines for Americans, why we have them and what they mean for you.

Every five years, the Dietary Guidelines for Americans are updated by an advisory committee to provide science-based recommendations to the public to promote health and reduce risk for chronic diseases. In addition, the Dietary Guidelines influence federal food and nutrition policy as well as education initiatives. The Scientific Report of the 2015 Dietary Guidelines for Americans Committee (DGAC) kept two facts in mind while combing through the literature on nutrition and health: approximately two-thirds of U.S. adults are overweight or obese, which increases their risk of developing certain chronic diseases, and about half of all American adults have one or more preventable, chronic diseases. Overconsumption of calories, poor diets and lack of physical activity are considered the primary causes of becoming overweight and obesity, as well as chronic disease. And therefore, all are preventable and the Dietary Guidelines are intended to steer Americans in the right direction. In addition to these two overarching themes, the DGAC took a close look at what Americans are eating and what nutrients are missing from our diets.

IT'S SAD: THE STANDARD AMERICAN DIET

We are an overfed yet undernourished nation. The aver-

age American diet is high in calories as well as nutrients and foods that contribute to adverse health effects. According to the DAGC, Americans are consuming too much sodium, saturated fat, refined grains, sugar-sweetened beverages (drinks with added sugars), sweets and desserts.

The Scientific Report of the 2015 DAGC suggests a diet including less than 2,300 milligrams of sodium per day, yet they dropped previous recommendations for those with heart disease to decrease sodium intake even further to 1,500 milligrams per day, citing there is no evidence that it is necessary or beneficial to decrease sodium intake below 2,300 milligrams. The Scientific Report also recommends avoiding partially hydrogenated oils since trans fat intake from partially hydrogenated oils is associated with increased risk of cardiovascular disease. In addition, less than 10 percent of total calories should come from saturated fat and foods high in saturated fat should be replaced with unsaturated fat, particularly polyunsaturated fats.

Research shows this strategy can help reduce total and LDL cholesterol. Here's an example: take butter or shortening and swap it out for soybean, corn or safflower oil. The Scientific Report cites several research studies that collectively indicate reducing saturated fat or total fat and replacing it with any type of carbohydrate is not an effective strategy for reducing risk of cardiovascular disease. In addition, low-fat diets that replace fats with refined carbohydrates such as cookies, candy and white bread are also bad for cholesterol and blood lipids (since refined carbohydrates increase triglycerides and lower HDL cholesterol). And therefore, total fat shouldn't be the focus but instead choosing better sources of fat should be.

Also, the Scientific Report recommends consuming a max-

imum of 10 percent of total calories from added sugars while low-fat and nonfat foods high in refined grains and added sugars should be avoided. Foods and beverages high in added sugars should be replaced with healthy options, including water, as opposed to foods and beverages that contain low-calories sweeteners. This makes sense— if you normally drink soda, replace this with sparkling or tap water.

In addition to overconsuming certain nutrients, many Americans are not meeting their dietary requirements for specific vitamins and minerals. These shortfall nutrients include vitamins A, C, D, E, folate, calcium, magnesium, fiber and potassium. In addition, iron is recognized as a shortfall nutrient for adolescent females and premenopausal women— the two groups that are most likely to be deficient in this mineral. Because low intake of these nutrients could lead to adverse health effects, the Scientific Report encourages foods that are good or excellent sources of these nutrients— vegetables, fruits, whole grains and dairy.

The DGAC also identified three healthy eating patterns that meet the nutrition goals for most nutrients. Healthy U.S.-Style Patterns are nutrient-rich versions of current food consumption patterns in the United States. Healthy Vegetarian Patterns will be based on what vegetarians eat and include more legumes, processed soy products, nuts, seeds and whole grains compared to the Healthy U.S.-Style Patterns while leaving out meat, poultry and seafood. Calcium levels are highest in this pattern because it not only contains dairy but also tofu, which is typically made with calcium. Healthy Mediterranean-Style Patterns will be based on Mediterranean diet patterns and include more fruit and seafood and less dairy than Healthy U.S.-Style Patterns. Because this diet includes less dairy, it also includes lower amounts of calcium.

KEEPING THE FOOD SUPPLY SAFE AND SUSTAINABLE

The Scientific Report also addresses the impact of food and beverages on the environment from farming to waste disposal. Focusing on the effect our food intake has on the environment helps ensure a safe and sustainable food supply now and for future generations. And, because the average U.S. diet requires a tremendous amount of resources including land, water and energy to produce, food production accounts for 80 percent of deforestation, more than 70 percent of freshwater use and up to 30 percent of human-generated greenhouse gas emissions. In addition, overcrowded fisheries and fully tapped wild caught fisheries may make it a challenge to produce enough safe seafood at an affordable price for Americans.

According to the Scientific Report, a sustainable diet is higher in plant-based foods, including vegetables, fruits, whole grains, legumes, nuts and seeds, and lower in animal-based foods. In addition, a sustainable diet is a healthy diet that can be achieved through the three recommended dietary patterns. Moderate consumption of seafood is associated with health benefits and an important component of two of the three dietary patterns, and though seafood contains organic pollutants as well as mercury, both of which are associated with health concerns, the Scientific Report suggests what nutrition experts have been saying for years: the health benefits of seafood far outweigh any potential health concerns. If you're interested in finding out which fish are best for your health and good for the Earth, check out the Monterey Bay Aquarium's Seafood Watch program at seafoodwatch.org.

Some congressional representatives, particularly those from states where many cattle farms reside, are pushing back against sustainability recommendations by suggesting that environmental concerns may distract the public and doing so detours from the purpose of the Guidelines. In addition, the meat industry is up in arms because the suggestion to decrease animal-based foods, including red meat, doesn't take into account the nutrition value of lean cuts of beef. Beef is not only rich in protein— and animal-based proteins generally contain more of the amino acids necessary for building and retaining muscle— but also lean cuts of beef contain several other nutrients and can be enjoyed while still staying within the saturated fat guidelines. The meat industry has also zoned in on iron, given that many women are not consuming enough of this mineral.

For the first time ever, coffee and caffeine intake will be addressed in the 2015 Dietary Guidelines for Americans. The DAGC found no association between moderate consumption of coffee (up to 400 mg of caffeine per day or the amount in three to five cups) and long-term health risks in healthy individuals. In addition, coffee consumption is associated with a reduced risk of type 2 diabetes and cardiovascular disease, while some evidence also suggests regular coffee/caffeine drinkers have lower rates of Parkinson's disease. Children

and adolescents should limit or avoid caffeine due to a lack of caffeine research in these age groups.

SHOULD YOU FOLLOW IT?

Few people would disagree with the DAGC assessment of the typical American diet. Many people are getting too many calories while eating nutrient-poor foods. As a result, a good portion of the population is falling short on certain vitamins, minerals and plant-based compounds necessary for good health and disease prevention while overconsuming nutrients and foods that may contribute to adverse health effects. And, years of research show that primarily plant-based diets are associated with a decreased risk of certain cancers, cardiovascular disease and lower bodyweight.

In addition, a recent study found that a vegetarian diet with fish (pesco-vegetarian diet) was more effective than both a vegan diet and lacto-ovo vegetarian diet (including milk and eggs) for lowering the risk of colorectal cancers, the second most deadly cancer in the U.S. And though it isn't entirely clear if the link between vegetarian diets and a reduced risk of certain cancers such as colorectal cancer is the result of cutting out meat or increasing plant intake, it is very clear that this dietary pattern is associated with improved health. And therefore, even if you disagree with parts of the 2015 Dietary Guidelines for Americans, keep in mind there are a variety of effective dietary approaches depending on a person's main goal (weight loss, reduction in IBS symptoms, etc.). However, when taking the current science on dietary intake and disease risk into account and combining it with typical American eating patterns and nutrient intake, the Dietary Guidelines provide a sound approach for decreasing and maintaining a healthy weight while also lowering one's risk of chronic disease. ■

THE AVERAGE AMERICAN DIET IS HIGH IN CALORIES AS WELL AS NUTRIENTS AND FOODS THAT CONTRIBUTE TO ADVERSE HEALTH EFFECTS.

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LEUCINE: #1 MUSCLE ACTIVATOR

Our bodies build muscle in response to hours of pounding in the gym and attention to recovery outside the gym. Training literally beats us down. Training puts our bodies in a catabolic state, breaking down glycogen, muscle and fat. With the right behaviors in the kitchen and the shaker cup, we can reverse this destructive process and grow from our efforts.

Nature inherently wants to conserve energy, and building muscle takes lots of energy. Muscle is heavy, and metabolically active. If there's no fuel available, nature says we can't afford to build muscle. Our bodies have to be able to sense whether there is enough fuel in our environment to build muscle.

It was once thought that insulin was the driving force behind muscle growth. If sugar calories were available, muscle could grow, right? Boost insulin and build muscle, right? Wrong! The existence of plenty of sugar (glucose) in our system only tells the body that we don't need to break down muscle for energy. Thus, insulin's main role is to store those nutrients and avoid breakdown of what was stored.

Insulin encourages the body to store glucose in muscle, liver and fat. It clears toxic sugar out of our blood. Yes, sugar is toxic. Sugar caramelizes our insides in a reaction with proteins that makes them foreign to our immune system. The subsequent inflammation from sugar leads to further tissue damage, insulin resistance and an inability to repair muscles after exercise.¹ Sugar is KRYPTONITE! It makes us weak!

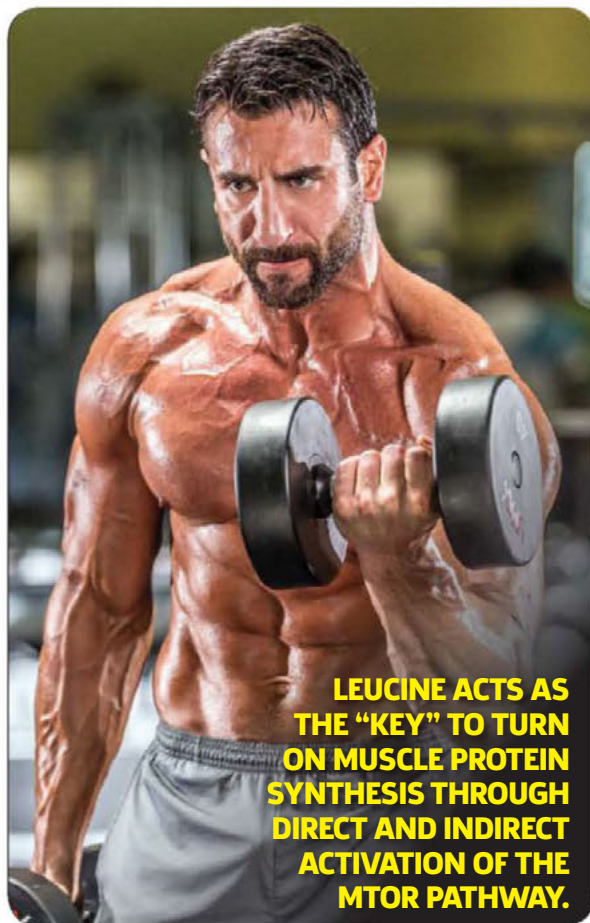
In fact, it only makes sense that nature would have a non-insulin-dependent way of differ-

entiating whether or not there are nutrients available to build muscle. Since our bodies can make glucose from particular amino acids and fats, glucose isn't a great way to sense whether nutrients are available in our environment in order to grow. In other words, we need a better signal, a "key" if you will, to build muscle other than glucose, because our bodies already auto-regulate blood glucose to feed the brain.

THE ANTI-KRYPTONITE THAT BUILDS MUSCLE

We need the "anti-kryptonite." It would make sense that the nutrient signal from our food would come in the form of an essential nutrient that our bodies can't make and can't become glucose. There are essential amino acids, essential fats, but no essential carbohydrates. Since the essential fats play a structural role and combine with a glycerol backbone that can be converted into glucose, this leaves the essential amino acids as a potential "key" to turn on our nutrient sensor.

In particular, the essential amino acids that our body can't convert to glucose (i.e., non-glucogenic or purely ketogenic), lysine and leucine, make the most sense as a nutrient to turn on muscle. However, lysine can



**LEUCINE ACTS AS
THE "KEY" TO TURN
ON MUSCLE PROTEIN
SYNTHESIS THROUGH
DIRECT AND INDIRECT
ACTIVATION OF THE
MTOR PATHWAY.**

be converted to carnitine for fat shuttling, and its uptake is easily inhibited by leucine; thus, leucine wins! Leucine is the anti-kryptonite!¹ It can't become glucose, it stimulates insulin release and it builds muscle as metabolic currency!

Science supports that there's a threshold in our diets that must be met in order to turn on muscle protein synthesis. One study demonstrated that distributing protein evenly throughout meals in the day was more effective than the typical "skewed" American diet.² Most Americans eat very little protein at breakfast, a little more at lunch and a lot more at dinner. When scientists put equal amounts of protein in each meal with the same daily total as a skewed diet, the equally partitioned meals resulted in better muscle protein synthesis.

Further, when balanced protein is fed to those dieting with four meals per day, they maintain muscle better than when they follow a skewed protein pattern.³ This probably isn't news to you, as most fitness enthusiasts understand the importance of preparing high-protein meals evenly spaced throughout the day. Just like any other "stimulus," whether lifting for a body part or eating a meal, the system needs some downtime to restart growth.⁴ It is presumed by this research on skewed diets that a threshold for turning on muscle protein synthesis wasn't being met by the lower-protein meals (breakfast and lunch).

Science has suggested that the threshold for turning on muscle protein synthesis is met by the leucine content of a protein. Our bodies sense the leucine content of our meals through complex molecular mechanisms. Simply, leucine acts as the "key" to turn on muscle protein synthesis

through direct and indirect activation of the mTOR pathway.¹ Moreover, it does this in a manner that doesn't depend on the presence of insulin.⁵ Thus, the leucine content of a meal could affect a meal's ability to build muscle after training.

Despite the confusion created by the Recommended Dietary Allowance (RDA) for protein requirements of 0.8 grams per kilogram of bodyweight per day, sports science shows that this is highly inadequate for strength-training athletes. Furthermore, the RDA doesn't say "high-quality proteins." All proteins are not created equal in their ability to support metabolism and build muscle. Studies show that it takes 30 percent more soy protein to have the same effect on muscle protein synthesis as whey protein.⁶ It just so happens that whey protein has 30 percent more leucine, gram for gram, than soy protein.

OUR BODIES RESPOND WITH MUSCLE GROWTH

Regardless of all this science, we, as humans, are definitely made to respond to leucine with growth! Whey is the protein richest in leucine. Whey and casein make up the milk proteins. Cow's milk contains 80 percent casein and 20 percent whey. However, human milk contains 60 percent whey and 40 percent casein. Mother's milk contains nearly 10 percent leucine, similar to whey protein concentrates. When we are growing our most, as infants, nature has decided that we need more leucine. If you want to grow, you need to focus on the leucine content of your meals.

Some feel that once leucine has reached a minimum threshold, often around ~2 grams in a meal, muscle protein synthesis is maximally turned on and extra leucine won't have a greater effect. However, a study in relatively young, active-duty military personnel demonstrated that 3.5 grams of leucine mixed with essential amino acids was more effective in turning on muscle protein synthesis than 1.87 grams of leucine with the same amino acids.⁷ Besides, the older we get, the less sensitive we become to leucine's signal to make muscle.⁸

One thing is for certain—you can't just chew on leucine all day and expect to grow lots of muscle. Leucine is the key to turn on the car (so to speak), but you need fuel to keep it running, which also requires intermittent rest stops. Leucine acts as a switch to turn on muscle growth, but if the essential amino acids found in complete proteins aren't available, there are no materials to build the muscle.

When scientists put leucine in the drinking water of rats, despite the constant leucine stimulus, they failed to build more muscle. When there is a "de-synchronization" in the leucine stimulus and availability of essential amino acids, we fail to achieve the goal of turning on muscle growth.⁸

In addition, leucine may act as a signal to limit food intake by acting on mechanisms in the brain.⁹ Leucine says, "Quality food has been eaten, and we can stop eating now." This is great if your goal is to lose weight and starve yourself, but if you stop eating without having eaten a good blend of essential amino acids from food, your muscle won't grow. The moral of the story is that leucine is nature's way of knowing that high-quality protein has been eaten and we can build muscle. You shouldn't take leucine supplements by themselves to build muscle.

My suggestion, as explained by my book *Leucine Factor Diet* (available November 2015) and App (available at the App Store), is that you should shoot for optimizing the leucine content of the proteins you eat. All proteins have a different percentage of leucine. Shoot to optimize your muscle metabolism and insulin sensitivity with the anti-kryptonite effects of leucine. ■

Dr. Victor Prisk is a board certified orthopaedic surgeon and IFBB professional bodybuilder in Pittsburgh, PA. Dr. Prisk is an active member of the GNC Medical Advisory Board and creator of the "G.A.I.N. Plan." He is an NCAA All-American gymnast, champion swing dancer and NPC Welterweight National Champion.

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OMEGA-3 UPDATE

For many years, the fats in our diets were vilified. The politics and misguided policies of the '80s resulted in a fat-free fad where all of the palatable fats in our foods were replaced by sugars. We are now realizing the political and economic follies of our ways. There's a crisis of the metabolic syndrome that includes obesity, hyperlipidemia, hypertension and insulin resistance that now drains our medical systems and tax dollars.

Unfortunately, sports nutritionists still believe that carbohydrates are the driving force behind athletic performance. As a result, the essential nutrients that can really boost our performance are treated with benign neglect by the nutrition policymakers and demonized by the media. The reality is that the essential amino acids from protein and the essential fats are critical to our well-being and lean muscle potential.

It is clear that the omega-3 fatty acids are especially important in our health. Initial interest in the cardiovascular benefits of fish oils was incited by the finding that Eskimos and other populations that consume diets rich in these fatty acids have extraordinarily low incidences of cardiovascular diseases. The effects of these fatty acids appear to be on many different physiological processes, including a reduction of inflammation, improved blood flow, positive changes in lipid metabolism and the list goes on.¹

FISH OILS FOR FAT BURNING

Over the past 30 years, there's been significant interest in the therapeutic potential of fish oils for a variety of inflammatory conditions such as arthritis, inflammatory bowel diseases and asthma in humans. Fish oil, rich in omega-3 polyunsaturated fatty acids (PUFAs), exerts anti-inflammatory and immune-modulatory effects, making them useful as a nutritional combatant to exercise-induced inflammation and immune suppression resulting from intense training. The long-chain omega-3 PUFAs eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found in fish oil appear to have additional anti-inflammatory properties, primarily through their effects on the neutrophil and macrophage constituents of the inflammatory response. These are white blood cells that attack infections and help rebuild tissues.

New data suggests that the types of macrophages in our fat changes as we go from lean to fat. Initially, we have healthy macrophages that produce mediators that reduce inflammation and improve the metabolic function of our adipose tissue. As we get fatter, inflammation builds up and unhealthy or "bad" macrophages come in and perpetuate metabolism-crushing inflammation. Since EPA from fish oil is particularly known to have strong anti-inflammatory effects, it was hypothesized by scientists that supplementation with EPA could help limit the damaging effects of bad fat.²

Scientists fed mice a high-fat, calorie-rich diet with the goal to make them obese and induce

inflammation.² In one group of mice, the researchers replaced 15 percent of the fat with EPA to see if it improved their physiologic function. Amazingly, the EPA-treated mice showed significantly reduced bodyweight and adiposity or "fatness," while decreasing the size of fat cells and reducing the amount of inflammation, compared to the high-fat fed controls. Furthermore, when the mice that became fat were given EPA, they reversed their fat cell size and reduced inflammation. Mechanistically, EPA also improved the fat cell's ability to burn fat and utilize oxygen.

IMPROVED EXERCISE PERFORMANCE

Although some of the literature is conflicting between endurance training and strength training, there appears to be a net beneficial effect to using omega-3 fatty acids from fish oils to improve exercise performance.¹ It appears that the anti-inflammatory effect reduces muscle damage and delayed-onset muscle soreness, and the improved blood flow brings in more nutrients to grow. You must remember, though, that the omega-3 fatty acids used in these studies are the long-chain fatty acids, especially EPA, derived from fish oil. The omega-3 fatty acids from foods like flaxseed oil have to be elongated by enzymes in your body that are very inefficient at doing so. So suck it up, and slurp down some cod liver oil. Just kidding—take the pills ... it's easier.

Because fish oils have such profound effects on our muscle and fat metabolism, a particular area of research interest is the treatment of complications related to aging. Our sensitivity to leucine decreases as we age—and thus our ability to maintain and grow muscle becomes more difficult. We must make a concerted effort to eat leucine-rich foods. Furthermore, as we age, we experience more tissue breakdown and inflammation in our bodies that we can combat with omega-3s. After age 50, we can lose more than one percent of our muscle mass

**FISH OIL-DERIVED
OMEGA-3S
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ENHANCE
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BREAK MUSCLE
DOWN.**

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per year, and lose more than two percent of our strength as a result. This even occurs in the diehard exercisers. The result is falling and hip fractures, which can lead to death in 50 percent of those over 80.

Studies on patients wasting away from cancers and inflammatory problems like rheumatoid arthritis have demonstrated that fish oil supplementation can significantly reduce the decline in muscle mass seen from these conditions.³ Thus, doctors decided to experiment with feeding the elderly Lovaza, a prescribed fish oil supplement containing 1.86 grams of EPA and 1.5 grams of DHA, and observed their muscle mass and function over a six-month period. The amount of fish oil provided was equivalent to the amount one might find in seven to 14 ounces of salmon. Amazingly, this simple intervention significantly increased muscle mass and strength in this population of 70-year-olds. Laboratory data supports that fish oil-derived omega-3s cannot only enhance muscle protein synthesis, but can also prevent the catabolic pathways that break muscle down.³ The authors reported that although their fish oil intervention wasn't quite as effective as a resistance-training routine, it was at least equally if not more effective than results achieved from testosterone, growth hormone and DHEA treatment studies.

MUSCLE GROWTH AND METABOLISM

Another omega-3 science update in 2015 suggests that omega-3 supplementation may express some of its benefit through modulation of insulin-like growth factor-1 (IGF-1).⁴ IGF-1 is a protein hormone that travels in the bloodstream, bound to other proteins called IGF-binding proteins (IGFBP). When released by these proteins, the IGF-1 can exert its effects on muscle growth and metabolism. IGF-1 is mainly released by the liver in response to growth hormone, but can also be released by other tissues like muscle, to act locally.

Patients with cardiovascular disease have chronically low levels of IGF-1. Statistics suggest that reductions in serum levels of IGF-1 correlate to increased risk of heart failure and mortality from heart disease. Since omega-3 fish oils are capable of limiting mortality in heart disease, scientists explored whether omega-3 supplementation could be having an effect on the IGF-1.⁴ They performed a randomized, placebo-controlled trial of eight weeks where they supplemented subjects with 720 milligrams of EPA and 480 milligrams of DHA per day. Amazingly,

the omega-3 supplementation not only improved the low IGF-1 levels in these patients with cardiovascular disease, but it also increased the bioavailability of the IGF-1 by decreasing levels of the IGFBP-3.

Now, although omega-3 supplementation was able to increase IGF-1 in a chronically lowered state, this data does not suggest that healthy individuals with normal IGF-1 levels will experience a rise in IGF-1 above normal. However, in chronically stressed states like overtraining and lack of sleep, your IGF-1 levels may be too low to build the muscle you want. Those who are training with great intensity may also have exceedingly high levels of inflammation in their bodies, which could lead to metabolic dysfunction in both muscle and adipose tissue. This dysfunction could lead to a failure to build muscle and mobilize fat for burning. According to the studies presented in this article, omega-3s could help you to restore normal physiology to this bug-laden system.

I will admit that I am a huge proponent of supplementing your body with the essentials. Whether it's a multivitamin, leucine or a conditionally essential nutrient like creatine, supplements help you achieve your training goals. Your body can make creatine—however, if you are weight training, you need to get more from your diet. If you aren't eating at least one pound of fish per day, you need to get some extra fish oil through a supplement. I used fish oil at two to four grams per day throughout my gymnastics and bodybuilding careers. Now I use fish oil to keep the muscle I built, reduce the joint pain I caused and keep my heart healthy for the long haul. Besides, with my work schedule and stress, I need the most IGF-1 boost that I can get. ■

Dr. Victor Prisk is a board certified orthopaedic surgeon and IFBB professional bodybuilder in Pittsburgh, PA. Dr. Prisk is an active member of the GNC Medical Advisory Board and creator of the "G.A.I.N. Plan." He is an NCAA All-American gymnast, champion swing dancer and NPC Welterweight National Champion.

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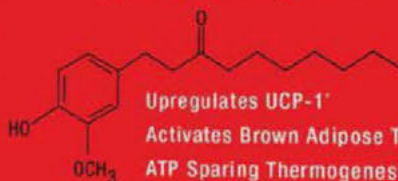
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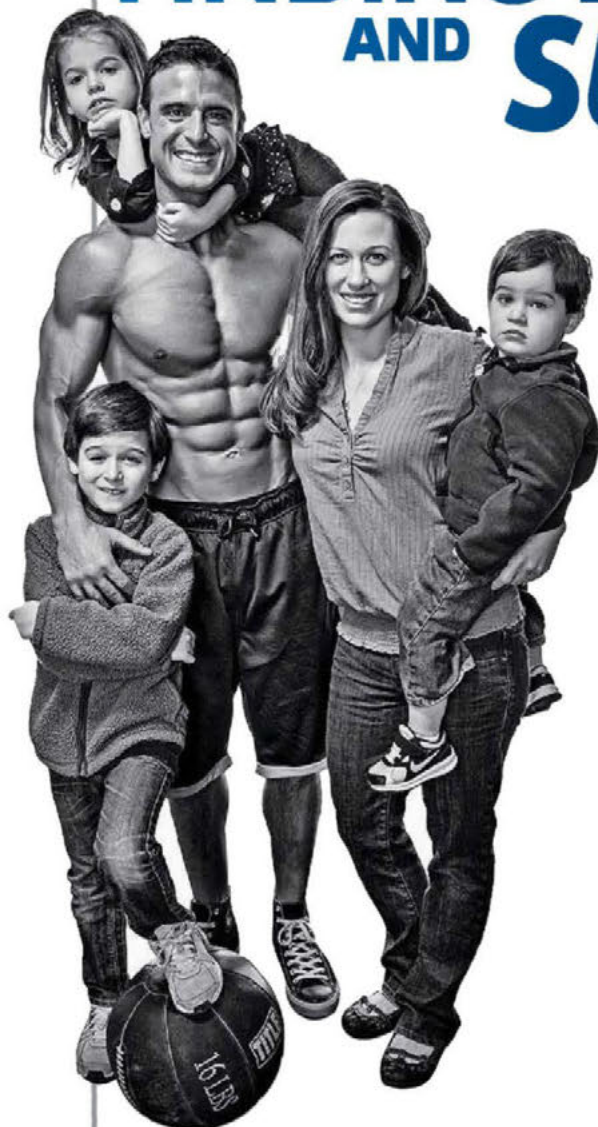


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FINDING BALANCE AND SUCCESS



I get a lot of questions from a lot of different people on a huge number of topics, and a great deal of them center on training. But there's one I get a lot from a different demographic—one that includes fathers—and it really encompasses a variety of aspects of life. It's "How do you do it?"

My initial response is usually, "Do what?" and it usually moves back to them asking how I'm able to have goals in the gym and show enough willpower to get ripped and lean, all while still being a "normal" human being, father and husband.

First, let's make one thing clear—I'm definitely not normal. But in relation to this, there are a number of factors in play and each one is extremely important.

I have a huge support system at home and that's absolutely necessary in making all of this—training, magazine covers, running a successful business—possible. My wife, Rachael, bought into this since day one, which happened to be more than 16 years ago. She knew my vision and she jumped on board, and that's been a major factor in putting this all together. I can honestly say I wouldn't have been able to do this without her support.

I will be the first to admit that I need help in finding the proper balance in my life. In this business, you are constantly trying to build. But that's not just the fitness industry. In any business, you are trying to grow and it's easy to fall into the mindset of work, work, work and neglect your family. Believe me, the balance is very tricky.

So how do you find that balance? Well, there are a couple of things you can do to help you reach your fitness goal or any other ventures you may have: Do them while everyone else is asleep, sleep less and sleep faster.

The "sleep faster" part I especially love, and it's something I got from Arnold. He references the "sleep faster" approach frequently, which means five to six hours of sleep is all you need when you are excited about life. That may come as a shock and may seem like a daunting challenge to some of you, but I assure it can be done and can make a huge difference in balancing everything when it comes to business, fitness and family.

Believe me, I wouldn't have been on the cover of FitnessRx if I didn't get up at 4 a.m. every day, plain and simple. It 100 percent wouldn't have happened. But since I get up at 4 a.m.—since I sleep faster—I made the time. This 4 a.m. time period is the only time I have the chance to go after my personal goals, whether it's powerlifting or fitness. That's the choice I made and it's been beneficial in a number of areas. I may get less sleep, but it allows me to train and reach those goals, which in turn leads me to have time to run a successful business and still be a dad and husband.

Is it easy? Of course not, but anything worth achieving isn't going to be easy, no matter what aspect of life it falls under. The thing that drives me daily is my "Why." I get up with every intention of living out this statement—"I will be the most impactful person in my industry and

change generations of Gregorys for what I achieve in this life." Simply put, I want to motivate generations that carry the Gregory name down the line, while also helping teach them to do the same wherever their passion may lie.

The same ideas can be applied to your life, whether it's training, business or family. I'll reinforce the idea that balance and trying to succeed in all three isn't easy, but it goes back to your "Why." If it's a strong "Why" and you have a serious amount of discipline and work ethic to match it, you can continue to reach new levels.

As Eric Thomas said, "When you want to succeed as bad as you want to breathe, then you'll be successful." I tell my son Alex, who is now 10, that Gregorys show up when it's time to shine. We prepare and work for big moments, and then deliver when those arrive.

It may sound like that only applies in sports, but I want that same mentality to carry over from sports into life. Deliver when the big moments arise and make sure you maintain balance in your life.

I've always had big dreams, but they become much more special when you have someone to share them with. I thank my wife and kids for dealing with my craziness and big dreams, but it's because of them that I get to live those dreams out each day. ■

BIOGRAPHY

Cory Gregory co-founded MusclePharm with Brad Pyatt in 2008 and serves as Executive Vice President. A former underground coal miner, Gregory worked diligently to save money to realize his dream of opening his own gym by the age of 20. In the last 15 years, he has gained extensive experience and has received a number of accolades within several aspects of the fitness industry. Obtaining an Exercise Specialist certificate from Columbus State, Gregory is also NESTA nutrition coach certified and Westside Barbell certified. In addition to his in-depth knowledge of bodybuilding and nutrition, he is a CrossFit Level-1 trainer further helping MusclePharm's athletes and ambassadors achieve their fitness goals. Gregory prides himself on embodying the MusclePharm culture, as he has been featured on the cover of top fitness magazines, including FitnessRx. Weighing just 208 pounds, he has achieved a powerlifting total of 1,755 pounds, culminating in a career-best 700-pound squat. Most recently, Gregory was added to the Arnold Schwarzenegger Fitness Advisory Board.

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TOUGH MUDDER TEAMS UP

MET-Rx has recently teamed up with Tough Mudder, the premier high-paced adventure obstacle series that has taken the world by storm. It was founded in 2010 by Guy Livingstone and Will Dean. This competition is considered one of the toughest hardcore competitions ever created. They hold more than 60 events each year in countries all over the globe. This partnership provides Tough Mudder competitors the best sports supplements to help fuel them through this grueling obstacle course event.

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One of the most popular products that contestants have fallen in love with is their Electrolyte Energy Gummies. When you put your body through such intense physical exertion, it is critical to provide the body with the optimal fuel sources to be able to continue at such a high-paced event. When you are putting your body through a beating, especially in the heat, it is imperative that you constantly supply an energy source that can keep your blood

sugar levels stable. Each packet contains 21 grams of the highest quality carbohydrates to keep you going and going, even when your body says no. This way you won't hit the wall halfway through the event.

HOLD ON, THERE IS MORE

Not to be forgotten is the delicate electrolyte balance that must be maintained for optimal performance. Without key electrolytes constantly being replenished, your health and performance can suffer greatly. This is where your muscles cease up and cramps kick in, only to dwindle your performance into a downward spiral. MET-Rx's Electrolyte Energy Gummies are just what you need in a time like this. They provide 40 milligrams of potassium and 75 milligrams of sodium per serving. They provide your body with a fast-acting energy source to keep your body's stores topped up when you need it most. This provides the best fuel source to hungry hard-working muscles, helping to sustain the intense workload that is commonplace with a Tough Mudder competition. This one-two punch provides your body just what it needs to get through the task at hand and make sure you come out a winner. They are also gluten free, so for those with celiac disease or those who may be gluten sensitive, consuming them is not an issue in the least.

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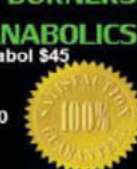
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THE KEY TO STAYING MOTIVATED

Q: Hey, Joe I have been following you on social media for the last three years now and I have really learned a lot in regard to fitness. I am a personal trainer at a local fitness center in my town and I have really used a lot of your advice on fitness and nutrition for my clients. I have done many of your workouts and have even enjoyed my nutritional intake so much more since I started following you in 2012. Most importantly, though, I have been able to change many lives based on the tips that you have given through your social media. That rocks!

However, I do find that many prospective clients (those who may impulse buy on a gym membership or those who buy training sessions but are impossible to get in touch with through text, call and email) tend to just lose motivation after a few months. I always attempt to relay to them what keeps me motivated, such as a will to prove to myself that I can and will not only reach my goals but also achieve even greater goals than I had originally set. This is probably a recurring question, but what is it that keeps you so motivated? What keeps you going at such a high level that you tend to keep getting better as you age? How do you manage to consistently train with such intensity, despite your multiple business ventures, which have you working 16- to 18-hour days regularly?

“PERSONALLY, I DO NOT GO INTO THE GYM LOOKING TO BETTER MY PHYSIQUE. I GO INTO THE GYM WITH THE IDEA THAT TODAY I AM GOING TO ATTEMPT THE IMPROBABLE.”

A: Thank you for your question and your kind words; I am truly humbled. Motivation is one of the most commonly misunderstood theoretical constructs. Motivation can be divided into two different theoretical constructs: intrinsic, which is internal motivation, and extrinsic, or external motivation.

Quite often in life we are motivated by external factors. We want to make more money to buy the nice house, the nice cars, sometimes to impress others. Extrinsic motivation is the most common type of motivation when it comes to fitness. People want to get in shape for the summer, a vacation, a show or some other fixed period in time. The problem with extrinsic motivation is that once that goal is achieved, motivation tends to radically dip or completely drop off altogether.

The key to staying motivated or keep-

ing the fire burning in others is to focus on intrinsic motivation. Quite simply, intrinsic motivation is your internal drive to constantly improve—whether it is seeking further knowledge, improving your craft or skill, or simply to improve something as trivial as your physique. Personally, I do not go into the gym looking to better my physique. I go into the gym with the idea that today I am going to attempt the improbable—that I am going to punish myself physically in order to gain mental strength and real self-confidence.

I design my workouts with the idea that despite my absolute best effort and performance, I am likely to fail. It is this constant challenge to best yesterdays effort, to constantly improve, that keeps my motivation at its peak, and has for years. I play head games within my workouts. How far can I push my body? How far

can I push past my mental limitations in order to hit my true physical failing point? Working out is not life, however I use it as a metaphor on how to live life. The gym, if you will, is my laboratory where my workouts are my experiments, and the results are the behavioral characteristics I develop through grueling efforts, which apply to every other area of my life.

There is no way that I could work the hours that I do, manage the ventures before me, if I had not taken the time to develop true intrinsic motivation. If you cannot be intense for 90 minutes in the gym, how can you expect to have any intensity about life? Focus simply on today's effort; build slightly on the day before. If you can make that your daily goal, the physical goals we desire in the mirror will now become a side effect of your daily efforts. ■

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